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ABSTRACT

The performance, economics and acceptability to users of the INSPEC SDI system were investigated in this study. The effect that provision of an SDI service might have on the information-use habits of users was also studied. The sample group of users consisted of 600 individuals of whom 540 were drawn equally from: universities and colleges, government research establishments, and industrial firms. The remaining 60 were small groups of people having common information requirements. A corresponding sample of 600 people was used as a control group. The SDI operation was designed to provide a weekly service to users. All of the methods used to operate the SDI system and the problems encountered are discussed in some detail. The users comments on the service are also included. (Volumes II through V are: LI004068 through 004071.) (Author/NH)

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INSPEC SDI INVESTIGATION

1967 - 1969

Volume I

(Chapters 1 to 11)

P Clague

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Chapter 1

AIMS AND BACKGROUND OF THE INSPEC SDI INVESTIGATION

Aims

The aims of the Investigation were to study the performance, economics and acceptability to users of the SDI system and to attempt to discover the effect that provision of an SDI service might have on the information - use habits of users.

Background

The original proposal for the Investigation was put forward by the National Electronics Research Council (NERC) to the Office for Scientific and Technical Information (OSTI). This proposal envisaged a programme of work divided into six phases. The first two phases covering the manual feasibility study and the system design was carried out by N.E.R.C. with the support of an OSTI grant and the results of this work were published in NERC report no. SDI/1 dated March 1966.

Subsequently the work was transferred to the Institution of Electrical Engineers from January 1967 to form part of its newly-formed INSPEC operation.

With some modifications, mainly in respect of the size of the sample user and control populations, the proposal for the remaining phases (Nos. 3-6) of the Investigation was re-submitted to OSTI and a grant was awarded to the Institution to carry out this work.

Phases 3-6 comprised the following:-

Phase 3 Collection of sample of participants, compilation of search profiles and initial testing of the system and the profiles.

Phase 4 Experimental service to users, profile analysis in the light of experimental results and feedback from users. Adjustment of profiles for start of operational service.

Phase 5 Provision of weekly operational service to users, assessment of service performance and acceptability to users.

Phase 6 Detailed analysis of results and writing of report.

The planned duration of Phases 3 and 4 was six months each and of Phase 5 twelve months. A proposed duration of six months for Phase 6 was reduced to three months, but with the possibility of review if this time proved insufficient.

The submission to OSTI - 'A proposal to investigate the selective dissemination of information (SDI Investigation, Phases 3-6), Institution of Electrical Engineers, December 1966' is given in Appendix 1A.

Following acceptance of the proposal by OSTI, work began on Phase 3 in July 1967. However, owing to the need to recruit staff, it was not possible to proceed fully until the middle of September and, as a result of this and of problems with the computer service, Phase 4 did not begin until May 1968.

During the next six months an experimental service was provided to users. A total of seven computer runs was made and the output despatched to participants for comment.

For various reasons, however, only a small proportion of participants received all seven outputs and by the end of six months the system was not functioning as well as had been hoped and planned. Faced with the choice of going ahead with the weekly service or delaying until the computer service had reached a more reliable state, it was decided that it was of prime importance to commence the regular service, even though it might be defective, rather that to risk disillusionment among the participants. It was, however, agreed that Phase 5 should not be considered to have started until certain basic requirements could be met by the computer service.

These requirements were in fact never met, and it is fair to

say that Phase 5 was never completed in any sense as originally envisaged. To the extent that the service provided was below the expected and potential level of effectiveness, the results of the investigation can only have been seriously impaired.

Staff

With the varied and fluctuating demands imposed on a small staff in providing a complex weekly service as well as running an investigation, the need for versatile and hard-working people was paramount. It was extremely fortunate that the Investigation staff worked as a team and took pride in rallying to overcome recurrent crises. Staff turnover during the investigation was fortunately very low.

The staff engaged on the Investigation at its conclusion in December 1969 were:

Manager	P Clague
Indexer/Analyst	D J Carr
" "	L Evans
" "	Mrs A Sharland
" "	Miss A Thompson
Investigation Secretary	Mrs P Passenger
Flexowriter Operator	Mrs S Howard
Typist	Mrs B Piggott
Clerk	Miss L Silverwood
Clerk (part-time)	Mrs E Simpson
Machine operator (part-time)	Mrs B Greene

The Investigation was under the general direction of Mr T M Aitchison and Mr C W Cleverdon acted as consultant.

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PREFACE

Although this report appears more than a year after completion of the Investigation it has been produced under greater pressure and to a tighter schedule than one would have wished.

In the original proposal to OSTI a period of six months was allocated for full-time work on analysis of results, additional studies, and writing and production of the report. In the grant awarded in 1967 this period was reduced to three months, with the possibility of further time being made available if required.

In the event, however, since the SDI Service provided in the Investigation was continued, without a break, as the present cost-recovery service, the availability of SDI staff for any analysis has been severely limited. In particular the writing of the report has had to be largely a spare-time activity carried out under considerable pressure.

Apologies are necessary and are freely offered for the inevitable shortcomings which the report has as a consequence.

Acknowledgments

In contrast it is pleasant to be able to acknowledge the assistance given by the many people who took part in the Investigation.

First of all thanks are due to the large numbers of research workers in universities and colleges, government research establishments and industrial firms, without whose constant, willing co-operation throughout two-and-a-half years, the Investigation would have been impossible. In particular, the librarians and information officers in their organisations who acted as Project Associates deserve our gratitude for helping to collect the sample of participants and keeping us in touch with the needs and opinions of their users.

The members of the SDI staff deserve the highest praise for the way in which they devoted themselves to the task of developing a new system, maintaining a weekly service under difficult conditions, and at the same time running an Investigation. The work load was at all times heavy, occasionally critically so, and carried out against a weekly deadline. This work could only have been carried out by a dedicated and adaptable staff.

The work of document indexing, profile compilation and analysis was carried out by Derek Carr, Lynn Evans, Mrs Ann Sharland and Miss Anne Thompson each of whom was responsible directly for some of the studies reported here.

Mrs Pam Passenger was responsible for the efficient organisation of the various and complex clerical supporting operations required for the Investigation. That no greater difficulty was encountered in data preparation on a heavily-loaded Flexowriter was due to the high output and accuracy of Mrs Sylvia Howard. Postal and other general record duties were efficiently carried out by Miss Linda Silverwood and the duties of notification despatch and machine operation by Mrs Elsie Simpson and Mrs Betty Greene respectively.

The work of the consultant on the Investigation, Mr C W Cleverdon, cannot be overestimated. The original idea for the work is owed largely to him and his advice and assistance have been invaluable throughout.

The last acknowledgment is the most difficult. The part played by Tom Aitchison in the SDI Investigation needs no explanation since his name has been synonymous with it from the early days of N.E.R.C. Insofar as acknowledgments can be properly tendered in such circumstances, they are expressed freely for his constant guidance and advice, and not least for his help with the writing of the final report.

P Clague
Manager, SDI Investigation

INSPEC
The Institution of Electrical Engineers
London

April 1971

Chapter 2

GENERAL REVIEW

In looking back over the Investigation the most obvious fact is that many changes have occurred in the field of library and information studies since the first proposals for this work were put forward by the National Electronics Research Council in September 1964. It would be surprising if, in this time and in the light of the research and development activity made possible by OSTI funding, and inspired in many cases by such seminal researches as those of Cleverdon and his fellow researchers at Cranfield, the context of the SDI Investigation had not changed considerably.

The investigation work formed one of the earliest proposals made to OSTI for financial support, at a time when selective dissemination of information was a very recent innovation, when co-ordinate indexing schemes and thesauri were still not in general use, and when such natural-language systems as existed did so in defiance of accepted dogma, before the revelations of the Cranfield II studies.

The large-scale nature of the proposed Investigation and the relatively large funding needed, tended to delay the start of the work.

Given that the proposal envisaged the first two phases of the work as preliminary manual feasibility studies and system design, it was sensible to fund these separately and to consider funding the remainder of the work in the light of the results. However such an arrangement entailed having to defer recruitment of staff for the main work until the initial report could be studied and funding agreed. The time to recruit suitable staff for an investigation can be very long and is often the critical aspect in programming the work.

In the SDI Investigation, although all the staff engaged in Phase 1 and 2 except the Director and Assistant Director left in March 1966, the main delay in starting Phase 3 was the extent of the financial support to be provided by OSTI and the method of funding. The matter was finally resolved by transfer of the work to the Institution of Electrical Engineers to form part of its newly set-up INSPEC operation and the receipt by the Institution of an OSTI grant to support the entire Investigation.

The delay involved in working out these arrangements and the need to find suitable accommodation for the Investigation at Stevenage, where the Institution had moved its main publishing and information activities, was not inconsiderable. Thus it was July 1967 before a start could be made on Phase 3.

The decision by OSTI to abandon the original plan of contracting all computer work to a commercial computer bureau and, instead, to buy the relatively-untested SDI programs for running at the newly-established Documentation Processing Centre was, in retrospect at least, unwise. As a result, major problems arose which are discussed at some length in Chapter 8.

However most of the problems mentioned so far are probably unique to an investigation conceived at a particular time and in particular circumstances and, though germane to an understanding of the work, have few general implications. Perhaps, therefore, it is more rewarding to consider other aspects of the Investigation.

Scale of the Investigation

The Investigation was from the first envisaged as a large-scale project involving the setting up and study of a regular weekly service to upwards of 600 users. In retrospect it is possible that there was some conflict in the logic of setting/up such a large system as the basis for an investigation. One reason for deciding on the size was that a small-scale system could be too easily optimised to meet the known requirements of its few users and would in other ways not suffer the constraints of a large-scale service. At the same time, however, it was perhaps overlooked that in any investigation of an experimental service it is important to be able to modify the system and such modification is difficult when the system is large.

Investigation versus Service

One of the persistent problems in the Investigation was how to preserve a suitable balance between the need to maintain the regular service and the allocation of staff to the work of investigating that service. This task was made particularly difficult by deficiencies in the computer service and by the lack of an Indexer/Analyst during a critical part of the Investigation. However, leaving aside these particular problems, it seems clear that in any situation where a service and an investigation are being run jointly, the division of effort between the two must be properly defined since the demands of the service will always tend, by their immediacy, to absorb effort that should be devoted to the investigation.

It is possible that here again there was an underlying conflict in the purpose of the Investigation. On the one hand the official policy was that the Investigation was a research project in which the studies took precedence over the mere maintenance of the service. At the same time the results of many studies could only be useful if the service being used as the basis of the studies was not vitiated by some fault, including interruption of that service.

It was also felt that the assessment of the acceptability to users was at least as important as any other part of the Investigation; if it was not acceptable, many of the other studies became academic. Efforts to achieve an acceptable level of service therefore seemed sensible.

The question of acceptability and the linked question of the level of cost that people are willing to pay for SDI are of course critical to the setting up of a continuing service. It was unfortunately not possible to obtain meaningful computer timings for the SDI runs and in the light of the INSPEC SDI cost-recovery service programme it was decided to leave these questions in abeyance.

Weekly variation

One of the major things learnt during the Investigation was the difficulty of carrying out studies on a constantly changing system. In an SDI system, the data base, documents retrieved, relevant documents and to some extent the search profiles, all change from week to week. Some

studies requiring a real-life situation can, of course, only be carried out in such an environment, and for these the large number of uncontrolled variables have to be accepted. On the other hand there are many other studies relevant to SDI operations which might more conveniently be carried out in a different way.

Co-operation from participants

The assistance given by participants in the Investigation was one of the most gratifying aspects of the work. Initial doubts about the feasibility of a study based on regular, long-term co-operation from a large number of volunteers were quickly dispelled.

Profile

Perhaps the most important decision taken in setting up the Investigation was to attempt to cover the user's requirements in their totality. By the way the statement of his information requirements was invited, and the examples given him, the user was encouraged to seek to cover all his main interests.

This had at least two important consequences. First the size of the profiles was considerably greater than those of most other systems, where the aim of the profile is deliberately restricted. Second and undoubtedly the more important, the participant assessed the relevance of the notifications he received, not to his profile, but to his interests. This, of course, made it much more difficult to provide a satisfactory performance and it is surprising that the systems performance recorded on the Investigation was attained.

Although there is little doubt that any future SDI services are likely, for economic reasons, to limit the user's profile to only one or two of the main elements of his interests, it is considered that the decision to seek in the Investigation to cover all the user's interests as far as possible, was the correct one, since it provided an upper limit to the possible influence of SDI on the user. It must be admitted, however, that it imposed a very great burden on the staff in setting up and operating the service.

Chapter 3

SELECTION OF USER AND CONTROL GROUPS

It was decided that the size of the sample group of users of the SDI Service should be 600 of whom 540 were to be individuals drawn equally from

a) universities and colleges

b) government research establishments

c) industrial firms

The remaining 60 were to be small groups of people having common information requirements which could be served by a single SDI profile. Such groups were typically research groups in universities or in small firms.

A corresponding sample of 600 people was to be drawn in a similar way to act as a control group for some of the studies.

The work involved in drawing a random sample of 1200 people to represent the total population of electronics research workers was considerable. The basic problem was to discover which people were engaged in electronics research in each organisation and this was not made easier by questions of security, both industrial and national.

Drawing the Sample

Various methods had to be adopted for drawing the sample

to meet the individual requirements of different types of organisation. However, having obtained access to a list of the relevant people in the organisations the procedure was as follows:

1) Number all people on the lists

2) Select, using random number tables, an appropriate number of names to allow for a required user group and control group with an allowance for wastage

3) Send questionnaire and covering letter (Appendix 3A and 3B) to the selected people

4) Examine replies to determine whether the respondents were working in the field of electronics research

5) Assign valid replies, as received, alternately to potential user or control group

6) Chase non-replies to the questionnaire (Appendix 3C)

7) Invite potential users to participate in the Investigation (Appendix 3D)

8) Chase non-replies to the invitation (Appendix 3E)

9) Where the number in the potential control group exceeded the number of definite users, select at random an appropriate number of people from control group and treat as potential users as in (7) above

10) Where size of definite user and control group was insufficient, select further names from original list and repeat the procedure.

The cumulative losses at the various stages of collecting the user and control groups were naturally fairly heavy and to arrive at the required total of approximately 180 users and 180 controls involved contacting a much larger original number. Thus in the case of universities and colleges the size of the original sample to whom questionnaires were sent was 757, of whom 192 became eventual users. Figure 1 shows the figures for each of the three groups of users. Column 1 gives the number of people who received the questionnaires and column 2 the number of replies. To a large extent the suitability of the people making up the sample at this stage for use in the SDI investigation was unproved since we were operating on lists compiled on the basis largely of other people's assessment of what comprised

an electronics research worker. With the questionnaire returns, however, we were able to see for ourselves the type of work being done by people and it became necessary to eliminate some as unsuitable. There were, of course, various reasons for such unsuitability, but for the most part the people rejected were either not engaged in any type of research and development work or were engaged in fields which we did not consider to be electronics. Column 3 shows the number who replied to the questionnaire and were considered suitable. Of the University people who replied to the questionnaire a large number of those rejected were PhD students who expected to finish their theses within the next 12 months and were therefore considered unlikely to be available for the duration of the Investigation.

As mentioned earlier, approximately half of those replying to the questionnaire were invited to participate in the Investigation and receive the SDI service. Those wishing to do so were asked to complete the Statement of Information Requirements (Appendix 3F). The numbers invited and those accepting are shown in columns 4 and 5 of Figure 1. Here again, with the fuller information given in the Statement of Information Requirements, it became apparent that the SDI Service would not cover the interests of certain people and these had to be removed from the final user sample, which is shown in column 6.

It was intended originally to have, at this stage in the Investigation, a rather larger number of users to allow for expected wastage in the intervening period before the start of the weekly service. However, as can be seen, the extra effort required to obtain more users and, perhaps more important, the time required to complete the cycle of operations involved made it impracticable to obtain this extra margin of safety.

Composition of the sample

Undoubtedly a number of the users of whom profiles were compiled were on the fringe of the subject area of the Investigation. There were several reasons for this:

a) Difficulty in defining precisely what was meant by electronics research. We had listed the topics we expected to cover and to some extent accepted that the user's assessment whether his interests lay within the field was, at least initially, as valid as our own.

b) The large expenditure of time and effort required to select users and obtain information requirements statements, coupled with the urgent need to complete initial profile compilation and testing, tended towards a widening of our definitions to allow inclusion of users rather than their exclusion.

To some extent this modification in definition of the subject coverage was to be expected and the selection of articles could easily be adjusted to include the new topics. However, in some cases these fringe interests could only have been adequately covered by a major expansion of coverage. This was not possible and the coverage of these interests was bound to be partial.

Sampling methods for universities and colleges

Since there was no complete and up-to-date list of people engaged on electronics research in British universities it was decided to obtain this information direct from the relevant departments.

A letter (Appendix 3G) was sent to the heads of departments in universities and colleges where it appeared likely that electronics research was being done. Appropriate departments included Electronics, Electrical Engineering, Physics, Electron Physics, Engineering etc. Each head of department was asked to provide a list of all people engaged in electronics research (as defined in the letter) including lecturing and research staff and post-graduate students. Only those people expected to be still in the department by December 1968 (the expected terminal date of the Investigation) were to be included. One-hundred-and-thirty eight letters were sent and 125 replies were received from 78 separate institutions listing a total of 1362 research workers. The institutions and the number of people listed by each department is shown in Appendix 3H.

From the 1362 people it was decided to select 450 names to give the required 180 users plus 180 controls and an extra 90 to allow for wastage. Some 714 of the total were concentrated in 13 universities and colleges which had more than 30 research workers each. From these larger institutions it was decided to select both users and controls but from those having fewer than 30 research workers it was decided to select either users or controls, but not both. The 13 institutions made up just over half of the total and the same proportion was preserved in selecting the sample, i.e. it was decided to select 230 from the 13 and the remaining 220 from the other 62. Since the 13 listed a total of 714 research workers the 230 required were chosen by randomly selecting a third of those in each.

The remaining 62 institutions were numbered and selections made at random until the total number of research workers in those selected reached 220. This total was made up from

20 institutions. A second selection was then made from among this 20 to determine which should provide users and which the control group.

Apart from simplifying the visiting of users by the SDI staff, the concentration of users or controls in separate institutions was chosen to avoid the affect of the transfer of information between the users and controls and to allow comparison to be made with results in the 13 institutions which provided both users and controls.

In the light of the response to the questionnaire (approximately 60 percent including 10 percent from research students who were unsuitable owing to the fact that they would not be available up to the end of the Investigation) it was decided that a further sample would be needed.

Accordingly a further 75 were selected from the 13 universities having more than 30 research workers. A further 78 were selected from another eight universities and colleges, three of which were chosen to provide users.

By mid-November 1967, from the total of 602 questionnaires sent, 160 suitable users had been obtained and 162 members of the control group. Although a small number of user statements were still arriving it was thought unlikely that the required total of 180 in each group would be reached. A further random sample was therefore taken from those 33 universities and colleges which had not been previously selected to provide participants. Selections were made from these at random until those selected made up a total of 145 research workers. A second sample was then taken of the 11 contributing organisations to decide which should provide users and which controls. By this means names of a further 76 potential users and 73 potential controls were obtained.

A summary of the universities providing users and controls is given in Appendix 31 showing the numbers invited and the total replies to the questionnaire and to the invitation to take part.

Sampling methods for government establishments

For government establishments a somewhat different method had to be adopted. A list of suitable organisations thought likely to be engaged in some electronics research was drawn up and a letter sent to the director of each to seek approval for the participation of personnel of the organisation to take part in the SDI Investigation. A list of the organisations approached is shown in Appendix 31.

In nearly all cases the organisations had a librarian or information officer who had expressed willingness to act as Project Associate provided that his Director's approval could be obtained. The assistance given by Project Associates was important throughout the Investigation but was particularly vital during the crucial stages of collecting the sample of participants.

It will be realised that, with many of the organisations, considerations of security made it impossible to obtain a list of the people engaged in electronics research from which to draw the sample. In these cases, therefore, the actual random sample had to be made within the organisation by the Project Associate and the names of selected people sent to us to contact further. Instructions (Appendix 3L) were sent to the Project Associate to guide him in selecting the sample.

The actual number of participants to be selected from each organisation was chosen by SDI staff on the basis of an estimate of the likely amount of electronics research being carried out there. These figures had to be adjusted as it became apparent that some organisations would be unable to supply the estimated number of suitable candidates. The final sample obtained therefore cannot be said to represent the exact proportion of electronics research workers in each of the government establishments through a number contributed by each would generally be in relation to the amount of electronics research carried out.

Details of the participating organisations and the number of user's and controls contributed by each are given in Appendix 3I.

Sampling methods for industrial firms

In selecting the sample of users and controls from industrial firms the general problem, as with universities and government establishments, was that there was no simple way of establishing how many electronics research workers were employed by each firm. However, it was assumed, for lack of better information that the amount of research and, therefore, the number of research workers would be in proportion to the size of firm, i.e. number of employees.

This latter information was available for the electronics industry in the Eurolec Pocket Guide 1965. This divided firms into four groups as follows:

Group 1 firms with over 10,000 employees

Group 2 firms with between 3,000 and 10,000 employees

Group 3 firms with between 1,000 and 3,000 employees

Group 4 firms with less than 1,000 employees

Group 1 firms

The ten firms in this group employed together 62.4. percent of the total employees of the electronics industry. It was decided therefore, to select from these firms 230 (62.4 percent) of the 360 users and controls required from industrial firms. These were to be drawn equally from each of the ten firms, i.e. 23 from each. To allow for wastage it was decided to attempt to obtain initially 30 from each.

The firms in Group 1 were:

Associated Electrical Industries Ltd
English Electric Co Ltd
Elliott Automation Ltd
Ferranti Ltd
General Electric Co Ltd
International Computers and Tabulators Ltd
NV Philips Gloeilampenfabriken
The Plessey Co Ltd
Pye of Cambridge Ltd

Group 2

Group 2 firms employed 15.7 percent of the total employees of the electronics industry. Fifty-six (15.7 percent) of the total users and controls were, therefore, to be selected from firms in this group. However, to avoid dealing with too many individual firms, only six of the firms in this group were selected at random. From each of the six selected firms it was decided, therefore, to select 10 people, which number was made up to 13 to allow for wastage.

The initial firms selected were EMI Electronics Ltd, George Kent Ltd, Honeywell Controls Ltd, Sperry Gyroscope Co Ltd, S. Smith & Sons Ltd, and Associated Semiconductor Manufacturers Ltd. Two of these, Honeywell and Smith, were unwilling to participate in the Investigation and a further sample produced Thorn-AEI Radio Valves and Tubes Ltd and Rank Organisation Ltd.

Group 3

The Eurolec Pocket Guide listed 25 firms in Group 3. As these, together, employed 10.6 percent of the total employees in the electronics industry, 40 (10.6 percent) of the users and controls were to be selected from them. Six firms were selected at random but two of these, Foxboro Yoxall Ltd and Teddington Aircraft Controls were considered to be, strictly speaking, not electronics firms and a further selection was made. The final six were :

Hilger and Watts Ltd
Rediffusion Research Ltd
Ultra Electronics Ltd
Racal Electronics Ltd
A C Cossor Ltd
Texas Instruments Ltd

Six people were to be selected from each plus another two to allow for wastage.

Group 4

Approximately 900 firms were included in Group 4, ranging from one-man businesses to large organisations such as the Guided Weapons Division of the British Aircraft Corporation. Altogether the Group 4 firms were listed as employing 11.3 percent of the total electronics industry employees. It was decided in general to draw either users or controls from each firm, but not both as had been done with firms in Groups 1, 2, and 3. Because of the very large number of firms a random sample was made to produce a very short list of 40. A number of these had to be rejected either because they were too small to do any research or because they were subsidiaries of larger firms in Groups 1, 2, or 3. After this screening process some 26 firms remained and it was decided to invite these to supply names of electronics research workers and to select the 40 users and controls from the names supplied by the firms who replied.

Some problems occurred in obtaining lists of electronics research workers from industrial firms. These problems arose from two sources.

a) unwillingness of firms to communicate such commercially valuable information to an outside organisation

b) difficulty in supplying this information since it was not available in precisely the required form

Again the librarians and information officers were extremely helpful in solving this problem and were, in most cases, able either to supply a suitable list or to gain access to one from which they could make the necessary random selection under our instructions. The instructions are shown in Appendix 3L.

The organisations approached and the numbers of people selected from each for the user and control groups are shown in Appendix 3I.

Figure 1

Selection of participants in the SDI Investigation

Type of Organisation	QUESTIONNAIRES			INVITATIONS		
	Sent	Returned (%)	Suitable	Sent	Returned (%)	Suitable
Universities	737	616*(81)	515	275	206 (75)	192
Government	812	585 (72)	519	283	215 (76)	196
Industry	819	502 (61)	447	244	199 (82)	191
Total	2388	1703 (71)	1481	802	620 (77)	579

* Includes PhD students who had to be excluded since they were likely to leave before the end of the Investigation

Chapter 4

LOSS OF PARTICIPANTS THROUGHOUT INVESTIGATION

One of the most serious considerations in planning the Investigation was the possible loss of participants during the course of the Investigation. It was of considerable importance that the many aspects of the work which depended on the availability of data from a large-scale sample should not be adversely affected by loss of participants. Advice on the likely wastage rate was sought from various sources though there appeared to be little directly relevant experience. On the basis of known questionnaire return rates the possibility of having more than fifty per cent of users left at the end of the Investigation appeared slight. However, it was simply not practicable to allow this size of margin in the sample of participants. After consideration of the factors involved an estimate of thirty per cent wastage over the period of the Investigation was arrived at. The reasoning behind this figure is set out in Appendix 4A.

In fact, of the total of 571 users for whom profiles were originally compiled between July 1967 and March 1968 some 473, i.e. 83 per cent were still actively taking part in April 1969. (Actively meant that they had regularly been returning weekly relevance assessments and were not more than four weeks in arrears). Using a less strict definition the total number of current users was approximately 500. Figures for each participating organisation are given in Figure 1.

The definite known losses can be broken down as follows:

Left the organisation, or changed job, died, went abroad etc	22
Deleted owing to non-returns	17
Dropped out for no known reason	5
Withdrew owing to pressure of work or dissatisfaction	4
Withdrew at our suggestion - because of fringe interests	3

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Deleted owing to non-returns	17
Dropped out for no known reason	5
Withdrew owing to pressure of work or dissatisfaction	4
Withdrew at our suggestion - because of fringe interests	3

The wastage rate was least for universities and colleges and greatest for industrial firms though the difference was slight

Universities	169 from 195 (87%)
Government establishments	156 from 186 (84%)
Industrial firms	155 from 190 (82%)

Strangely the closing of the AEI Research Laboratories at Rugby where we had none original users did not seriously contribute to the greater loss in industrial users since after their dispersion to various locations, six of them continued to take part.

It should be remembered that the university participants were first asked to participate early in 1967 and a very large number first submitted their statements of Information Requirements in May/June of that year. Since various difficulties (chiefly associated with the computer) delayed the start of the experimental service (phase 4) the first notifications were not sent out until April/May 1968.

During this period very occasional contact was maintained by asking users to mark lists of documents against which test runs of their draft profiles could be evaluated. This lack of regular contact meant that users dropped out during this period and the extent of this loss was only discovered when users failed to reply to the experimental service notifications.

Regular communication would have overcome this problem but given the circumstances such communications could have been only of an apologetic or temporising nature and it was felt wiser to restrict communication until the situation was more hopeful.

The figures for profiles starting experimental service includes all users whose profiles had been tested and modified ready for service and who were not known to have dropped out for any reason.

The abbreviations used in Figure 1 are:

QMC - Queen Mary College

AUWE - Admiralty Underwater Weapons Establishment

BBC - British Broadcasting Corporation

CEGB - Central Electrical Generating Board

GPO - General Post Office

NPL - National Physical Laboratory

RAE - Royal Aircraft Establishment

RRE - Royal Radar Establishment

RSRS - Radio and Space Research Station

SERL - Services Electronics Research Laboratories

SRDE - Signals Research and Development Establishment

AEI - Associated Electrical Industries

BAC - British Aircraft Corporation

GEC - General Electric Company

ICT - International Computers and Tabulators

STL - Standard Telecommunications Laboratoris

TMC - Telephone Manufacturing Company

From Figure 1 it can be seen that loss of users was particularly heavy at AUWE, AEI Rugby, GEC Wembley and ICT Gorton. Apart from AEI where as mentioned earlier the closure of the Research Laboratories at Rugby caused problems in keeping contact with participants, the high wastage of participants appears to have been associated with postal difficulties presumably within the organisation itself. When the failure of communication was discovered a number of the defunct users were reinstated, notably in the case of GEC, Wembley.

Figure 1

Organisations participating in the Investigation and loss of participants

	Number of Profiles Compiled at November 1967	Started Experimental Service in April/May 1968	Started Service in November 1968	Operating at April 1969 (ie regular recent returns
Universities				
Bangor	6	6	5	5
Bath	11	11	11	10
Belfast	4	4	4	3
Birmingham	22	22	22	19
Aston	7	6	5	5
Brighton	9	9	8	8
Cambridge	12	12	12	10
Cardiff	1	0	0	0
Edinburgh	4	4	4	3
Exeter	3	3	3	2
Heriot Watt	4	4	4	4
Glasgow	8	6	5	5
Kent	1	1	1	1
Kingston	3	3	3	3
Leeds	6	6	6	6
Liverpool	8	7	7	7
City	5	5	4	3
Imperial College	8	8	8	6

Note: Figures relate to place at which people were recruited even though they moved later.

Figure 1 (contd)

Organisations participating in the Investigation and loss of participants

	Number of Profiles Compiled at November 1967	Started Experimental Service in April/May 1968	Started Service in November 1968	Operating at April 1969 (ie regular recent returns
Northern Polytechnic	3	3	3	3
OMC	7	7	7	7
University College	3	3	3	2
Manchester	5	5	3	3
Oxford	6	6	5	5
Reading	8	8	8	6
Rugby	1	1	1	1
Sheffield	10	10	10	10
Southampton	13	12	12	12
Swansea	5	4	4	4
York	3	3	3	3
Total	186	179	171	156

Note: Figures relate to place at which people were recruited even though they moved later.

Figure 1 (contd)

Organisations participating in the Investigation and loss of participants

	Number of Profiles Compiled at November 1967	Started Experimental Service in April/May 1968	Started Service in November 1968	Operating at April 1969 (ie regular recent returns
Government Establishments				
Aldermaston	26	26	25	21
Culham	8	8	6	6
Daresbury	3	3	2	2
Harwell	11	11	11	9
Rutherford	6	6	6	6
Winfrith	2	2	2	2
AUWE	3	3	2	0
BBC	2	2	2	2
CEGB	5	4	4	4
GPO Dollis Hill	20	20	20	18
Old Street	3	3	3	2
Proctor House	3	3	3	3
Miscellaneous	4	4	4	4
NPL	4	4	4	4
RAE	24	24	22	22
RRE	27	27	27	25
RSRS	14	14	14	14
SERL	6	6	6	6
SRDE	24	23	21	19
Total	195	193	185	169

Note: Figures relate to place at which people were recruited even though they moved later.

Figure 1 (contd)

Organisations participating in the Investigation and loss of participants

Industrial Firms	Number of Profiles Compiled at November 1967	Started Experimental Service in April/May 1968	Started Service in November 1968	Operating at April 1969 (ie regular recent returns
AEI Rugby	9	8	8	3
AEI Leicester	8	8	8	8
BAC	8	8	8	7
Creed	2	2	2	2
Elliott	16	15	15	11
EMI	4	4	4	4
English Electric NRL	10	10	10	10
English Electric Valve Co	8	8	8	7
Ferranti	12	12	12	9
GEC Wembley	11	11	11	2
GEC Stanmore	4	4	4	4
ICT Stevenage	8	7	6	5
ICT Gorton	7	6	3	0
George Kent	4	4	4	3
Marconi	13	13	13	13
Mullard	28	28	28	27
Plessey Nottingham	12	11	10	9

Note: Figures relate to place at which people were recruited even though they moved later.

Figure 1 (contd)

Organisations participating in the Investigation and loss of participants

	Number of Profiles Compiled at November 1967	Started Experimental Service in April/May 1968	Started Service in November 1968	Operating at April 1969 (ie regular recent returns
Plessey Romsey	7	7	7	7
Rediffusion	3	3	3	2
STL	10	10	9	7
TMC	6	5	5	5
Total	190	184	178	148

Note: Figures relate to place at which people were recruited even though they moved later.

Chapter 5

REASONS FOR LOSS OF PARTICIPANTS RECEIVING SDI SERVICE NOVEMBER 1968-NOVEMBER 1969

Although the rate of loss of participants throughout the Investigation fell within the expected limits it was decided to look more closely at the reasons for this loss and in particular the loss during the period that users were receiving regular weekly service, November 1968-November 1969.

In the earlier phases of the Investigation, which were devoted to collecting the sample of users, obtaining information requirements, compiling and testing profiles, there was little immediate advantage to any participant in continuing to give up his time to the Investigation. However, from the time the weekly service began to be provided it was obviously of considerable interest to know why people receiving such a service free-of-charge should choose to drop out.

A study was therefore made of those 69 participants who withdrew from the Investigation between November 1968 and December 1969 to discover their reasons for doing so.

Method

The records of the 69 participants were examined and compared with those of the total sample where appropriate to discover the reasons whether stated or underlying which led to their withdrawal from the Investigation.

On examination it became clear that eight of the 69 could really be considered not to have participated in the weekly service. Although notifications were sent to them for a short time they had not at this time or in the previous experimental running period returned any relevance assessments. As a result their profiles had necessarily remained untested. Their withdrawal could not, therefore, be considered to provide evidence of the acceptability or otherwise of the service.

The remaining 61 participants were found to fall into six categories according to the ostensible reasons for their withdrawal.

1) The participant's main field of interest fell outside the coverage of the SDI Service

In most cases these people had been included because part of their requirements were within our expected coverage and the pressure to make up the sample of participants dictated their inclusion rather than exclusion.

Five people fell into this category, four of whom withdrew on advice from the SDI staff that the poor service was unlikely to improve owing to the nature of their interests and the coverage of the service.

2) Participant left the United Kingdom

Eleven participants dropped out as a result of leaving the country to work abroad.

3) Participant changed the nature or place of employment

Nineteen users fell within this category, eleven of whom withdrew as the result of leaving their place of employment. Six more found that their information requirements or duties had changed so as to make the SDI service inappropriate. Of the remaining two, one was beginning a sabbatical year and for the other no reason could be discovered.

4) Pressure of work

Six users withdrew because pressure of work made it difficult for them to continue participation.

5) Satisfactory service already being received from other source

It was to be expected, particularly with those participants from government establishments and industrial firms, that many would be receiving an information service within the organisation which would overlap to a greater or lesser extent with the SDI Service.

Five users withdrew because they felt their internal service was better. In view of their subject interests it could be expected that three of these would not receive very comprehensive service from the SDI Service. One other was dissatisfied with the service coverage in that research reports were not included.

6) Participants failed to return notifications regularly

Participants were expected to provide regular relevance returns to allow assessment of the service. Those who failed to do so for a given length of time and after suitable reminders were dropped from the Investigation. Fifteen of the 61 were dropped for this reason. Of these seven were university participants whose returns may have been affected by vacations.

Underlying reasons

Although the reasons given for withdrawal did not appear to point to any dissatisfaction with the service it was considered that the ostensible reasons might be only part of the story. It was possible, for example, that the excuse of pressure of work, meant in fact that the time required to participate was not thought worthwhile in relation to the value of the service. An examination was, therefore, made of the background to each profile to see whether evidence of user dissatisfaction might exist. Sources examined for such evidence were the comments of the user during the service and at the time of withdrawal, performance figures for the profile, user rating of the service as expressed in the questionnaire, and the user's field of interest. The relevant information is summarized for the 69 participants in Appendix 5A, divided according to the reasons given for withdrawal.

Group 1

In the case of those main interests were outside the scope of the service four did not in fact withdraw voluntarily, but were advised to do so by the SDI staff. In the case of the fifth his requirements were for specific engineering design data which it was not the function of the service to provide.

Group 2

Leaving the country seems an adequate reason for dropping out of the Investigation and no underlying reason needs to be sought. Some did express a wish to continue receiving the service abroad, but failure by the others to make this comment cannot reasonably be construed as an unfavourable reflection on the service.

Groups 3 and 4

In the case of those who gave changed duties, changed subject field or pressure of work as the reason for withdrawal it is not possible to be sure that a poor opinion of the service did not contribute to their withdrawal. Even in the case of those who changed their place of work this in itself could not be considered a complete reason for withdrawal since the opportunity to continue participation was offered where we knew beforehand of the intended departure.

Group 5

Those who withdrew because they were receiving a more satisfactory service elsewhere were most definitely passing adverse comment on the SDI Service. Nevertheless, given their subject interests they were undoubtedly correct in feeling that the SDI Service would not provide coverage comparable to these other services. The lesson to be drawn is that the initial sample could well have excluded them since their subject interests lay outside the scope proper of the SDI Service.

Group 6

Though failure to return relevance assessments does not in itself indicate dissatisfaction with the service it does, given the concomitant threat of losing the service, indicate that the service is not enjoying the participant's highest regard. In addition the lack of feedback resulting from non-return of relevance assessments would, where service was unsatisfactory, serve to perpetuate this situation. In some cases the lack of returns was due to poor postal arrangements.

Of the fifteen people in this Group, seven had earlier returned questionnaires in which like all other participants they were asked to indicate that aspect of the service they found least satisfactory. On examination it was felt that the points they mentioned were valid criticism of the service they had received and could have contributed to their withdrawal.

The available information relating to each of the people who withdrew is summarised in Appendix 5A. This includes the type of organisation (university, government or industry), the date the service was suspended, the participant's rating of the service in his questionnaire, any relevant comments and the percentage Precision (P) or Recall (R) performance figures as available and the series of weeks to which they refer.

Correlation of user satisfaction with withdrawal

If it is assumed that dissatisfaction could be an underlying reason for withdrawal it is useful to examine the assessment of the service by people who later withdrew.

The questionnaire assessments are shown below for each group:

Group	VG	G	F	P	VP	Not Given	Total
1				2	1	2	5
2	1	5	3	1	1	-	11
3	1	4	5	1	-	8	19
4	-	-	3	-	-	2	5
5	-	3	2	1	-	-	6
6	1	1	5	-	-	8	15
Total	3	13	18	5	2	20	61

Fig. 1. Assessment of service by sample of 61 participants who later withdrew from the investigation.

The rating of the service by those who withdrew is shown in Figure 3, compared with that for all 423 participants who completed this part of the questionnaire.

Taking the groups where the precise reasons for withdrawal are not unambiguously clear, i.e. Groups 3, 4 and 6 the figures are:

Fig. 2. Assessment of service by 21 participants who later withdrew from the Investigation.

Group	VG	G	F	P	VP	Total
3	1	4	5	1	-	11
4	-	-	3	-	-	3
6	1	1	5	-	-	7
Total	2	5	13	1	-	21
Percentage	9.0	24	62	5.0	-	

These figures show only 33 per cent of the 41 rating the service Good or better compared with almost 53 per cent for the total sample of 423. On the other hand 62 per cent rated it Fair compared with 36 per cent. The question, therefore, largely revolves round the meaning of "Fair". However, it can hardly be taken as an enthusiastic comment, and even allowing for the very small sample there seems to be some reason to suppose that a somewhat poorer service may have been experienced by these 41 participants compared with the sample as a whole and this may have contributed to their withdrawal.

Chapter 6

SDI System Operation

The SDI operation was designed to provide a weekly service to users. The operation revolved round a fixed weekly computer run at which all file updating as well as the matching of the current documents against the profiles was done. The data preparation was done by the INSPEC SDI team at Stevenage and computer facilities at various locations were used during the course of the investigation, but all in or near Manchester.

Aim of the operation

In organising the operation there were two chief aims:

1) To minimize the delay between publication of the documents and their notification to users

2) To update users' profiles as quickly as possible whenever modification was required

A number of factors in particular served as obstacles to these aims:

a) Limited punching capacity of the single Flexowriter

b) Single weekly computer run

c) Delay in transport of material to and from the computer at Manchester

Document Supply

As mentioned elsewhere the document input to the system consisted of English-language periodical articles. Copies

of the periodicals required for scanning were obtained from the Acquisitions Section of Science Abstracts which was situated in Stevenage in a separate building some five minutes walk away. In view of the importance of a rapid service for SDI the relevant periodicals were made available to SDI immediately after they had been received and recorded by the Acquisitions Section. However, to avoid any danger of losing these periodicals, the originals were sent only where two copies were available. In other cases the contents list was photocopied and sent to SDI for selection of the articles required. On return of the marked contents list the relevant articles were copied and sent to SDI. This naturally introduced delay into the system at the start since in most cases approximately 36 hours would be needed to complete this particular cycle. Where a second copy of the original was available the delay was, of course, much less. However, in all cases a photocopy of the selected article was made and this became the material on which the indexers worked. The photocopies were required in the Investigation for later analysis after the original copies had been returned to Science Abstracts. To reduce the photocopying, only the first three and last two pages of each article were copied. In many cases this included the full article but even for longer articles it gave sufficient information for the indexers to work on.

Selection

In most cases the selection of material was carried out by the Manager of the Investigation or, in his absence, by the senior Indexer/Analyst. From the periodicals (listed in Appendix 6A) the articles selected had to meet the following criteria:

1) Within the field of electronics research as defined for the Investigation

2) In the English language

3) Of at least one page in length and normally by a stated author. The length requirement was relaxed in respect of certain high quality periodicals and in particular the "quick announcement" type such as Physics Letters where the articles tend to be very brief.

In general, articles devoted entirely to describing a

particular product of a manufacturer were rejected.

Document data preparation

After the documents were photocopied a document input sheet was attached to each on which was typed the title, author and citation details. In the latter the standard Science Abstracts journal abbreviations were used. The documents were then passed for indexing and from this stage each could then be dealt with as an independent item, i.e. there was no attempt to keep together articles from the same periodical.

With the index terms assigned by the indexers, the document input sheets were numbered serially and passed to the tape typist. The information on the input sheet was punched and any errors that the typist could see from the hard copy were corrected immediately. The hard copy was then checked and errors sent back for correction at a suitable time.

Before despatch to the computer centre the individual document tapes had to be re-run through the Flexowriter to form long combined tapes containing approximately 70 individual document details. This was a requirement for ease of handling by the computer operators. At the same time a hard-copy listing was produced in two copies, one for despatch to the Documentation Processing Centre with the tapes and one for our own records.

The need to produce the combined tapes and the hard-copy listing was unfortunate in that it absorbed Flexowriter time that could ill be spared. However, with the ever-present danger of run failure, provision of the listing gave DPC the necessary data for immediate failure analysis, thus minimizing the delay.

On the morning of the day for despatch of material to the computer, the last of the document tapes were combined and the document tapes sent off together with the tapes for updating the profiles and the descriptor file.

The tapes were despatched on Friday afternoon, thus giving two clear days (Saturday and Sunday) for them to arrive at Manchester in time for the scheduled computer run at lunchtime on Monday. However, it proved impossible to rely on this and the scheduled run had to be postponed till Tuesday lunchtime, thus increasing the delay by one day. In the best circumstances the output from the run would be received at Stevenage on Thursday just before mid-day.

Card Production.

The general form of output from the computer listed the numbers of the documents matching a given profile. The actual details of these documents were provided in the form of cards which were produced at Stevenage.

The original paper tapes for the individual documents remained at Stevenage after the reproduced combined tapes had been despatched to Manchester. During the period from despatch of the tapes to receipt of the computer output the individual tapes were fed through the Flexowriter to print the document details four-up on to Multilith masters. The masters were then run off on two-sheet white board 12" x 8" in size, which were then power-guillotined to produce the 6" x 4" notification cards.

The cards were placed in numerical order into pigeon holes in an array 15 horizontal by 20 vertical designed to allow a seated clerk to select from any hole.

Mailing and despatch

The postal arrangements required for an investigation involving a weekly service to each of 600 participants are in no way trivial. Among other things they entailed ensuring a weekly supply of 600 addressed envelopes for despatch of notifications. These were provided by IEE headquarters at Savoy Place on their addressing machine using address stencils cut and kept up-to-date by SDI staff. Since the addressing work formed only part of the operation of the headquarters department concerned, the regular and urgent supply of so many addressed envelopes was not always easily compatable with their other work and occasionally this aspect of the service caused problems.

On receipt of the continuous computer print out the three copies of the notifications were decollated and guillotined. Two copies of the notification were mated with the appropriate user's envelope and the third copy filed as a record of the notifications sent to the user for the particular week. Using the list of document numbers printed for each user the appropriate notification cards were selected from the card sorting racks and placed together with the two copies of the print out, the addressed envelope and a reply-paid envelope ready for recording and despatch.

Data recorded.

For each user a record was kept showing whether he had been sent notifications for any given week. Where no matching had been produced for any profile this fact was also recorded.

On the same sheet a record was made of the relevance returns received for each user and each week, showing the Precision performance as Relevance 1 and Relevance 2 documents expressed as a fraction of the total notifications sent. These records allowed the service received by each user to be assessed

quickly and action to be taken where necessary to improve performance or an examination to be made where few notifications were being produced.

In this connection it was discovered that the Precision performance figure based on R1 and R2 documents combined could hide cases of very poor R1 Precision. From week 030 onwards therefore R1 Precision figures were also recorded separately.

For each week a copy of each document input was kept together with its indexing sheet to allow subsequent analysis. Using the notification cards a file in serial number order was kept of all documents input to each week's run and a file by periodical title and issue number showing which articles had been selected from particular periodicals. This latter file was particularly valuable for failure analysis when users cited articles which the service had failed to bring to their attention.

Basic SDI service statistics

Various raw figures relating to the SDI service during the weekly operational service period (weeks 011 - 066) are given in Figures 1 and 2.

SDI SERVICE SUMMARY - DOCUMENT INPUT

WEEK NO.	DOCUMENTS INPUT	AVERAGE INDEX TERMS/DOC
011	199	6.8
012	206	7.4
013	267	9.1
014	251	9.0
015	250	8.2
016	254	9.0
017	241	8.8
018	244	9.0
019	245	6.8
020	196	7.3
021	124	7.6
022	223	6.5
023	344	7.6
024	237	7.4
025	179	7.7
026	375	5.8
027	322	5.4
028	246	5.3
029	205	5.3
030	215	5.3
031	340	5.1
032	358	5.0
033	348	5.2

WEEK NO.	DOCUMENTS INPUT	AVERAGE INDEX TERMS/DOC
034	347	5.2
035	344	5.1
036	321	5.2
037	300	5.0
038	346	4.9
039	341	5.7
040	343	5.7
041	347	5.7
042	268	6.0
043	188	5.3
044	206	6.1
045	295	5.8
046	273	6.2
047	245	6.4
048	243	5.9
049	246	6.5
050	246	6.3
051	195	6.0
052	241	6.7
053	250	6.3
054	242	5.4
055	314	5.8
056	275	8.1

WEEK NO.	DOCUMENTS INPUT	AVERAGE INDEX TERMS/DOC
057	259	7.4
058	293	6.9
059	300	6.6
060	266	7.2
061	310	7.0
062	232	6.5
063	233	7.2
064	400	7.2
065	246	7.2
066	288	6.7

Chapter 7

Delays in Service

In setting up the service it was hoped to achieve a median delay of approximately eight days from receipt of the original journals to despatch of the notifications.

This remained a noble aspiration that at no time appeared in danger of attainment. In fact, the overall delay does not appear to have dropped at any time much below 16 days and at times reached 28 days.

There are, of course, many reasons for the much longer delays, but undoubtedly the fact that, on average, at least six days were required for the computer part of the operation, i.e. from despatch of tapes to receipt of output, was a constant contributory factor. It should be remembered however, this figure of six days includes two non-working days, i.e. Saturday and Sunday, and all the delays quoted are elapsed time, not working days.

The second major factor in the delay was the fixed weekly computer run. Any items missing one run were subject to another seven days delay before they could be input. The effect of this can be seen clearly in the graphs showing cumulative overall delay for different periods. (Figs 1-16)

To achieve maximum currency of the material it was of the highest importance to minimize delay between receipt of journals and the despatch of tapes to the computer. This in turn entailed minimum delay in keyboarding the document input. However, the capacity of the single Flexowriter was barely sufficient to cope with demand and one of the highest priorities of the operation was to keep the machine loaded

at all times. This in turn necessitated keeping a backlog of material and militated against the keyboarding of separate batches of documents.

Fortunately the Flexowriter was a fairly reliable machine and the percentage of down-time was relatively small. However, any loss of time was a serious matter and even routine servicing became a problem. Occasionally it was necessary to ask the service mechanic to postpone the service when he arrived at a particularly critical time.

Although the Flexowriter was the most serious bottleneck in the system other machines were an important part of the operation and could cause trouble and delay. The most heavily used of these was the Rank Xerox 914 copier used to copy the documents required for indexing. Breakdown was less serious here than with the Flexowriter since it was not being used to the same percentage of capacity. However, any breakdown could cause delay, particularly at critical times in the weekly operation.

The third machine was a Multilith small offset litho machine. Although this was not very heavily loaded, the quality of work needed was high since it was used to print the card notifications. Thus, even relatively minor blemishes could not easily be accepted and it was necessary to call in the service mechanic fairly often. This normally involved a delay of a couple of days and could, therefore, cause problems in spite of the greater spare capacity.

There is no doubt that running a weekly service which depends heavily on the regular operation of several machines is not a comfortable occupation. Fortunately the people operating the machines became adept at fault diagnosis and temporary repairs, and ingenious at devising alternative methods of working which enabled at least part of the operation to continue.

Fluctuations in document intake

The system was designed on an estimate that the document input to the system would be approximately 240 per week. This estimate was made on the basis of an examination of the journal literature made in 1967. Even assuming that this estimate was accurate at the time, it was certainly out of date by 1969 when the service began. However, in the first 15 weeks of operational service from November 1968 the average input to the system was 235 documents per week.

In the next ten weeks the input averaged 315 per week and it was realised that the low numbers in the earlier period had been due to delay of material from the United States due to industrial disputes. By reducing the number of index terms per document and by some overtime work it was possible at times to achieve a throughput of 350 items in a week but this was not sufficient to prevent a build-up of a formidable backlog. Naturally in these circumstances the overall delays became very large. Thus, in Fig 13 it can be seen that for this period (weeks 033-035) the median overall delay was 28 days. This period of heavy document inflow lasted until about Week 045 and it can be seen that in the following three weeks 046-048 the delay was reduced somewhat to 24 days. By Weeks 059-061 the delay was down to sixteen days.

Summary

Although considerable emphasis was placed on minimizing the delays of the system it was at no time possible to achieve the currency that we would have liked, for three major reasons:

1) One weekly computer run at a fixed time and at a distant location via an intermediary (DPC)

2) Limited data preparation capacity on a single Flexowriter

3) Large fluctuation in the supply of material for input

It might be expected that it would be possible to single out some period of the 12 months operation as typical, but this is not easy without risking bias. However, the system did reach some kind of normality towards the end of the 12 months and it may be supposed that the 16 days overall delay achieved in this period represents what the system was capable of in normal circumstances. In some weeks the delay may have been two or three days less when all factors were operating favourably.

In the light of actual circumstances the original aim of nine days delay was unrealistic. However, with a system allowing four days from receipt of documents to despatch of output and two days for despatch of notifications, none of which is unreasonable, an overall delay of nine days would appear to be achievable.

Fig. 1 SDI Service delay - Selection indexing and data preparation

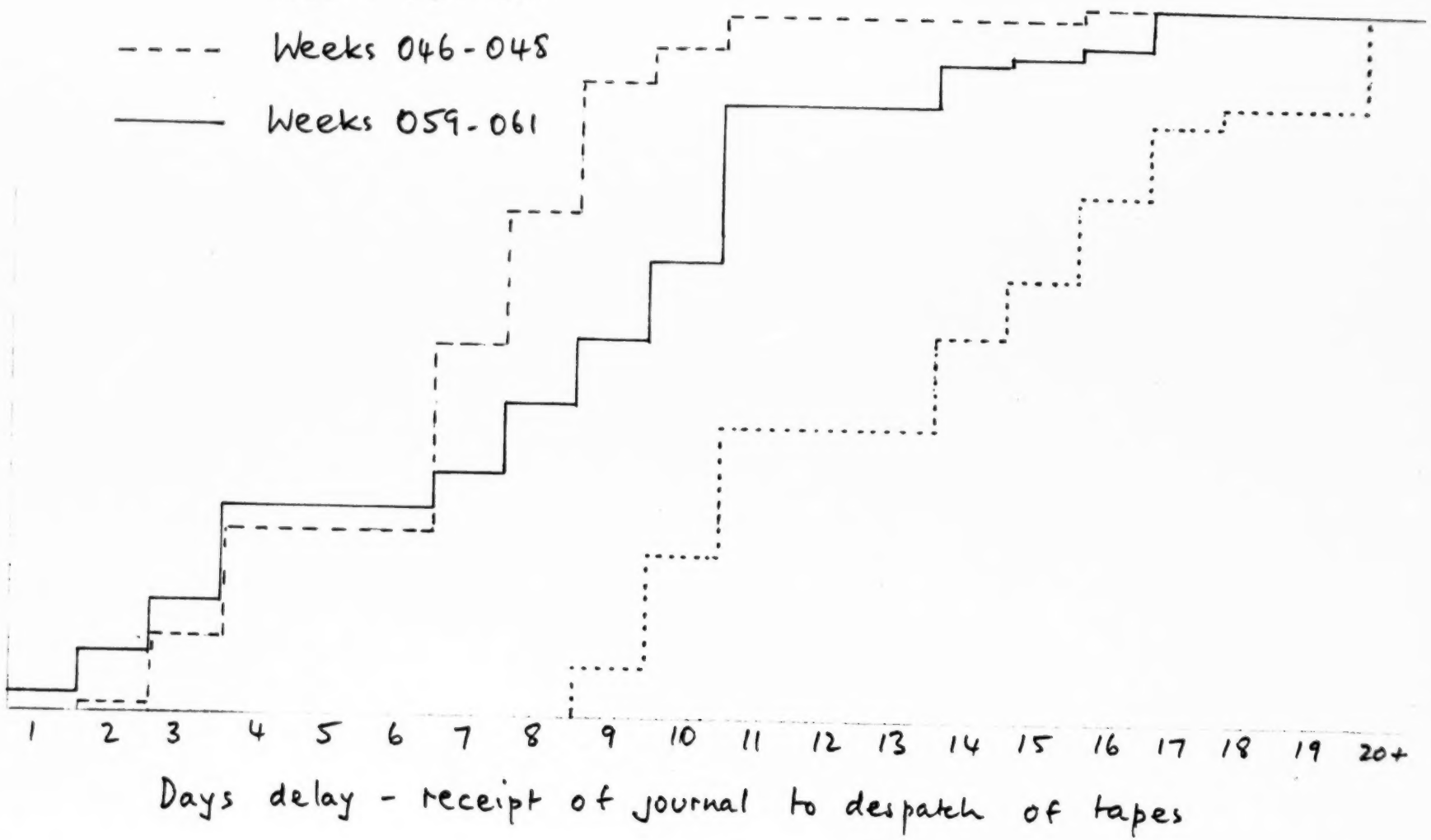

Fig. 2 SDI Service delay - Selection, indexing and data preparation

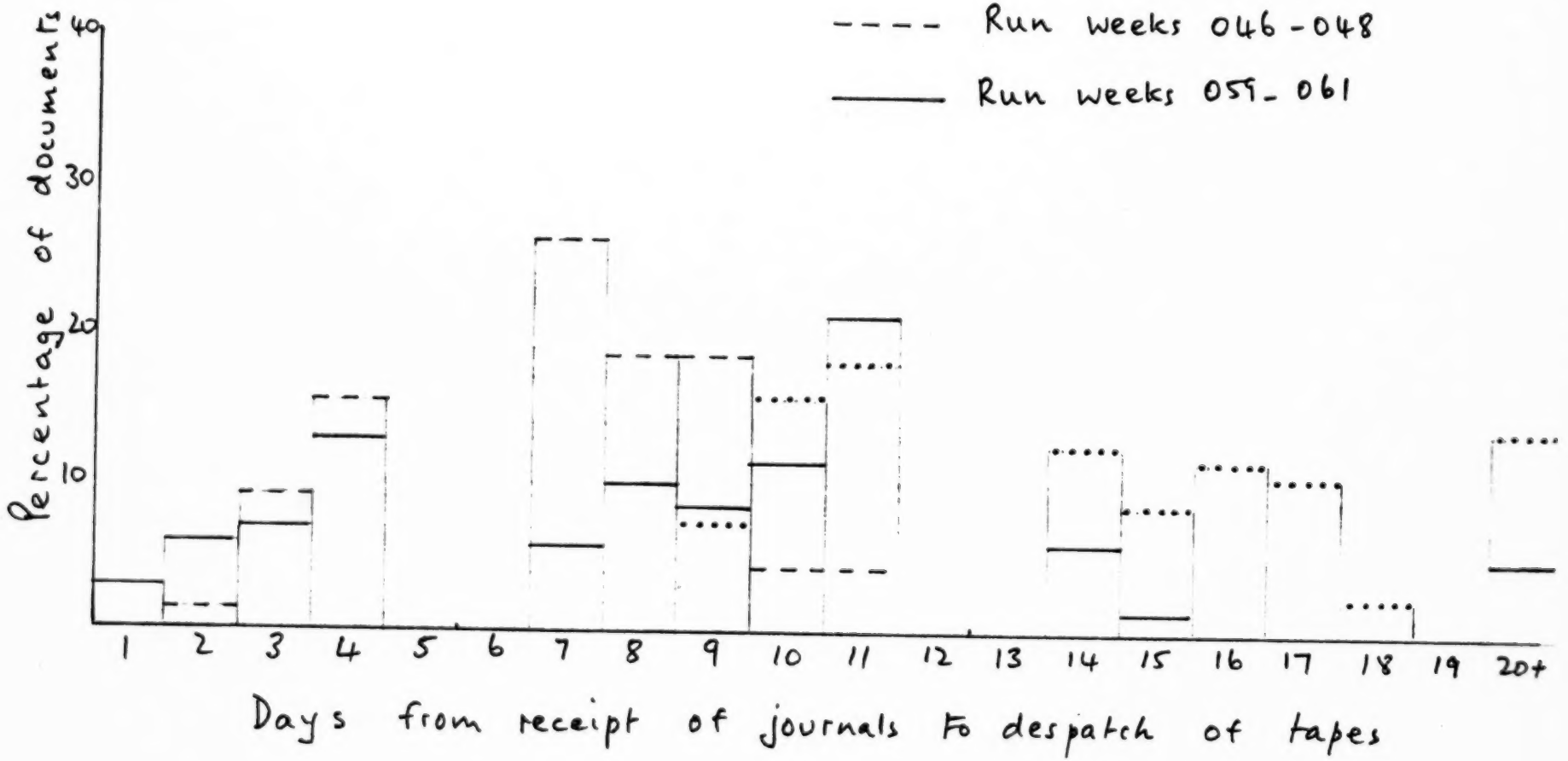
..... Run weeks 033-035
---- Run weeks 046-048
——— Run weeks 059-061
Percentage of documents
40
30
20
10
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+
Days from receipt of journals to despatch of tapes

Fig. 3 Delay from receipt of journals to despatch of tapes

Run Nos. 033-035

No. of documents in sample - 105

No. of documents for which date of receipt is known - 95

Delay (Days)	No. of docs	%	Cum. %
1			
2			
3			
4			
5			
6			
7			
8			
9	7	7.4	7.4
10	15	15.8	23.2
11	17	17.9	41.1
12			
13			
14	12	12.6	53.7
15	8	8.4	62.1
16	11	11.5	73.6
17	10	10.5	84.1
18	2	2.1	86.2
19			
20			
21	4	4.2	90.4
22	3	3.2	93.6
23	3	3.2	96.8
29	2	2.1	98.9
32	1	1.1	100
	95	100	

Fig. 4 Delay from receipt of journals to despatch of tapes

Run Nos. 046-048

No. of documents in sample - 79

No. of documents for which date of receipt is known - 65

Delay (Days)	No. of docs	%	Cum. %
1			
2	1	1.5	1.5
3	6	9.2	10.7
4	10	15.4	26.1
5	-	-	26.1
6	-	-	26.1
7	17	26.1	52.2
8	12	18.5	70.7
9	12	18.5	89.2
10	3	4.6	93.8
11	3	4.6	98.4
12	-	-	98.4
13	-	-	98.4
16	1	1.5	99.9
	65	100	

Fig. 5 Delay from receipt of journals to despatch of tapes

Run Nos. 059 - 061

No. of documents in sample 88

No. of documents for which date of receipt is known 70

Delay (days)	No. of docs	%	Cum. %
1	2	2.9	2.9
2	4	5.8	8.7
3	5	7.1	15.8
4	9	12.9	28.7
5	-	-	28.7
6	-	-	28.7
7	4	5.8	34.5
8	7	10.0	44.5
9	6	8.6	53.1
10	8	11.4	64.5
11	15	21.4	85.9
12	-	-	85.9
13	-	-	85.9
14	4	5.8	91.7
15	1	1.4	93.1
16	1	1.4	94.5
21	1	1.4	95.9
22	1	1.4	97.3
23	1	1.4	98.7
28	1	1.4	100.1
	70	100	

Fig. 6 SDI Service delay - computer service

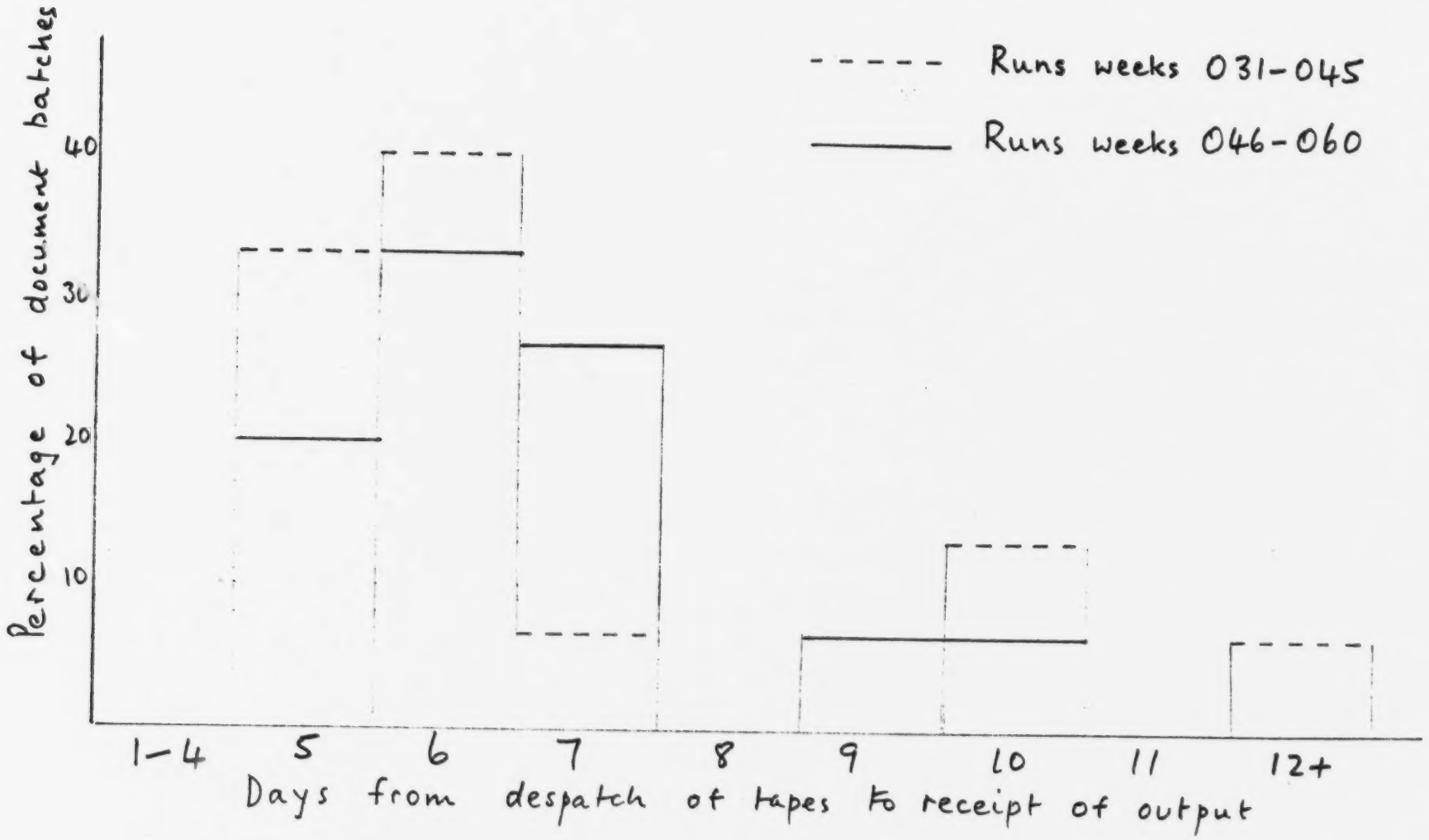

Fig. 7 SDI Service Delay - Computer

Runs 031-045

Delay between despatch of tapes & receipt of output (days)	No. of runs	%
1		
2		
3		
4		
5	5	33.3
6	6	40.0
7	1	6.7
8		
9		
10	2	13.3

Fig. 8 SDI Service Delay - Computer

Runs 046-060

Delay between despatch of tapes & receipt of output (days)	No. of runs	%
1		
2		
3		
4		
5	3	20.0
6	5	33.3
7	4	26.7
8		
9	1	6.7
10	1	6.7

Fig. 9 SDI Service delay - Despatch of notifications

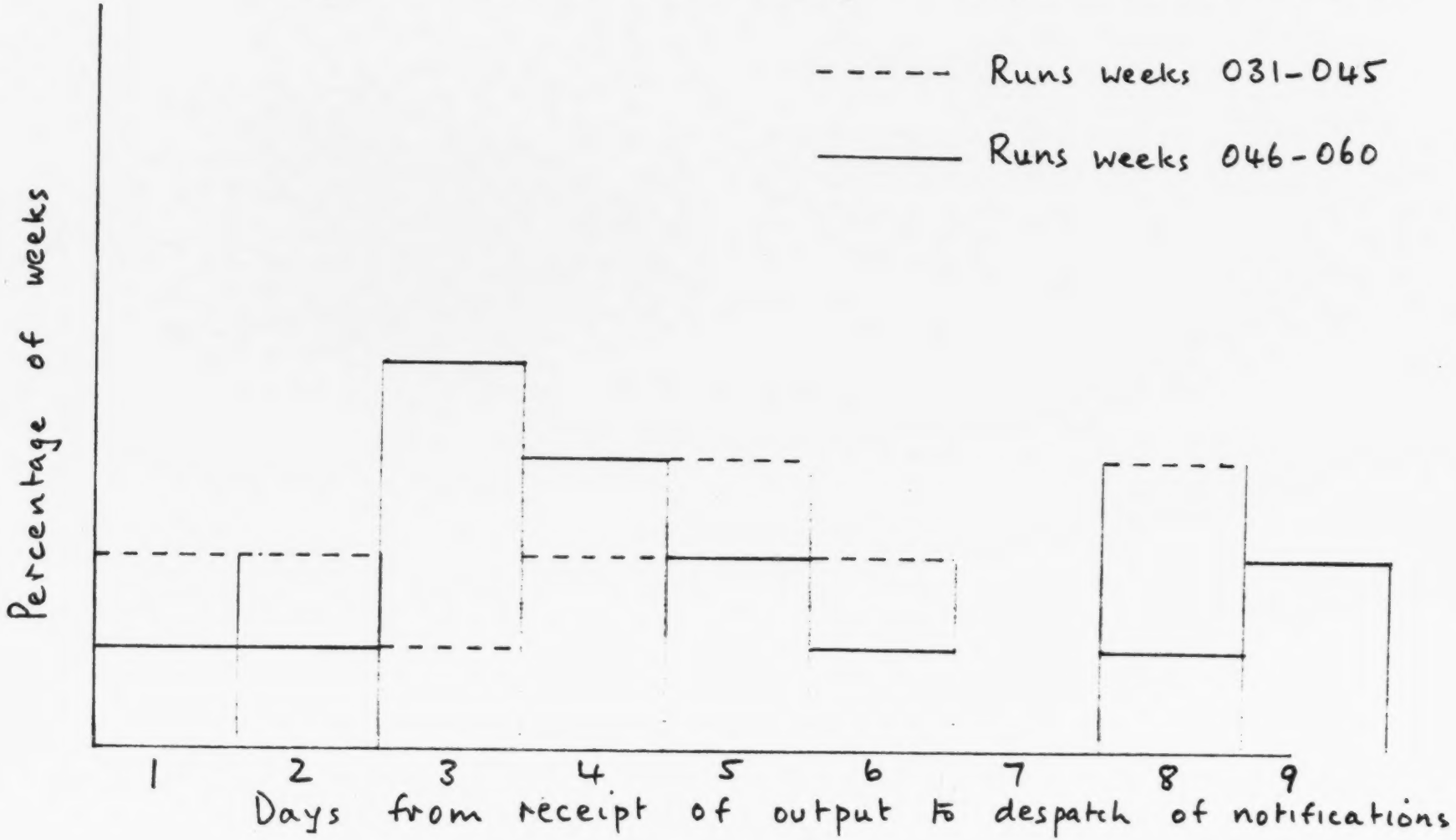

Fig. 10 SDI Service Delay - Despatch of Notification

Runs 031-045

Delay between receipt of output & despatch of notifications (days)	No. of runs	%
1	2	13.3
2	2	13.3
3	1	6.7
4	2	13.3
5	3	20.0
6	2	13.3
7	-	-
8	3	20.0
9	-	-

Fig. 11 SDI Service Delay - Despatch of Notification

Runs 046-060

Delay between receipt of output & despatch of notifications (days)	No. of runs	%
1	1	6.7
2	1	6.7
3	4	26.7
4	3	20.0
5	2	13.3
6	1	6.7
7	-	-
8	1	6.7
9	2	13.3

Fig. 12 SDI Service delay - Total delay

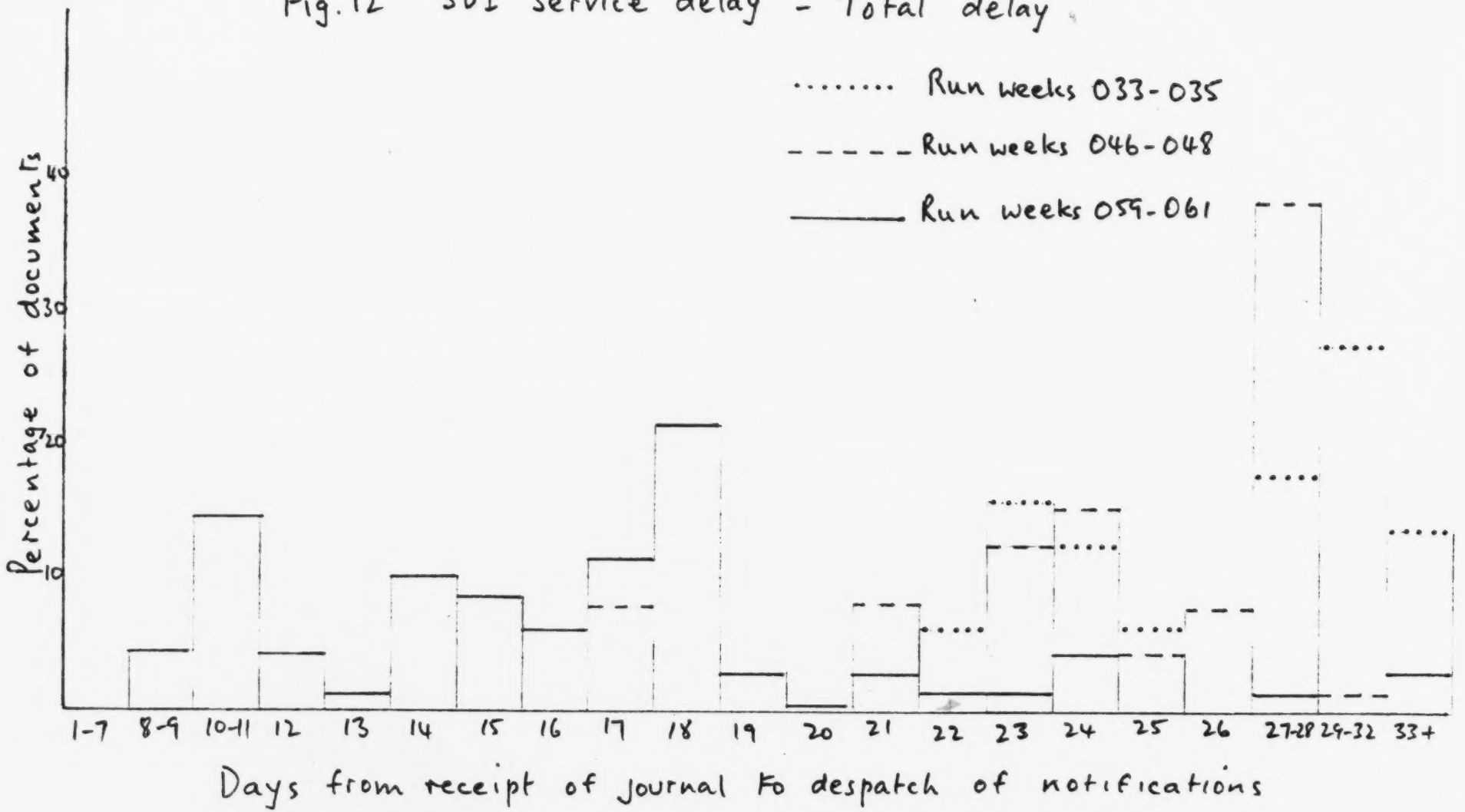

Fig. 13 SDI Service delay - Total delay

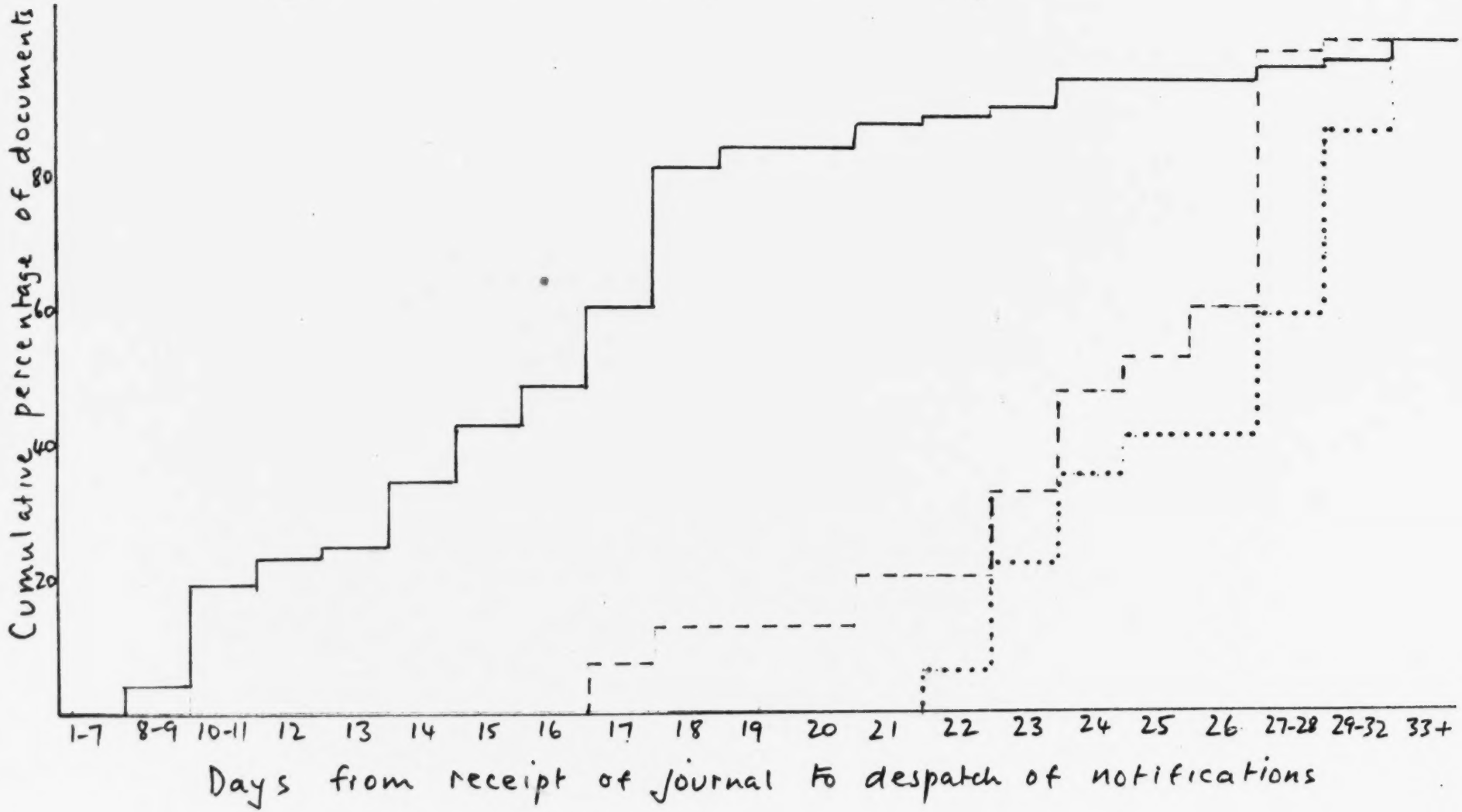

Fig. 14 Total delay from receipt of journals to despatch of notifications

Run Nos. 033-035

No. of documents in sample - 105

No. of documents for which date of receipt is known - 95

Delay (days)	No. of docs	%	Cum. %
20			
21			
22	6	6.3	6.3
23	15	15.8	22.1
24	12	12.6	34.7
25	6	6.3	41.0
26	-	-	41.0
27	8	8.4	49.4
28	9	9.5	58.9
29	11	11.5	70.4
30	9	9.5	79.9
31	5	5.3	85.2
32	1	1.1	86.3
33	-	-	86.3
34	4	4.2	90.5
35	3	3.2	93.7
36	-	-	93.7
37	3	3.2	96.9
42	2	2.1	99.0
46	1	1.1	100.1
	95	100	

Fig. 15 Total delay from receipt of journals to despatch of notification

Run Nos. 046-048

No. of documents in sample - 79

No. of documents for which date of receipt is known 65

Delay (days)	No. of docs	%	Cum. %
16	-		
17	5	7.7	7.7
18	3	4.6	12.3
19	-	-	12.3
20	-	-	12.3
21	5	7.7	20.0
22	-	-	20.0
23	8	12.3	32.3
24	10	15.4	47.7
25	3	4.6	52.3
26	5	7.7	60.0
27	16	24.6	84.6
28	9	13.8	98.4
29	-	-	98.4
30	1	1.5	99.9
	65	100	

Fig. 16 Total delay from receipt of journals to despatch of notification

Run Nos. 059-061

No. of documents in sample - 88

No. of documents for which date of receipt is known 70

Delay (days)	No. of docs	%	Cum. %
8	2	2.9	2.9
9	1	1.4	4.3
10	4	5.8	10.1
11	6	8.6	18.7
12	3	4.3	23.0
13	1	1.4	24.4
14	7	10.0	34.4
15	6	8.6	43.0
16	4	5.8	48.8
17	8	11.4	60.2
18	15	21.4	81.4
19	2	2.9	84.3
20	-	-	84.3
21	2	2.9	87.2
22	1	1.4	88.6
23	1	1.4	90.0
24	1	1.4	95.7
28	1	1.4	95.7
29	1	1.4	97.1
33	1	1.4	98.5
35	1	1.4	99.9

Chapter 8

COMPUTER SERVICE FOR THE SDI INVESTIGATION

The computer aspects of the Investigation were undoubtedly the least satisfactory.

It would be possible to go into very considerable detail but the main contributing factors may be fairly quickly summarised.

1. The programs written by English Electric Leo Marconi were not fully tested before being put into use for the Investigation. This was not the fault of EELM since the large amount of data required for full validation was not available at the time.

2. In view of the setting up of the Documentation Processing Centre it was decided that this body should be given responsibility for providing the SDI Computer Service to the Investigation. However only one person in the organisation had sufficient experience of KDF9 programming to be able to deal with the EELM programs. Since Mr Price as head of DPC, had many other responsibilities, he was unable to spend sufficient time on dealing with the frequent problems involved in setting up a new service using somewhat untested programs.

3. DPC had no computer of its own but used time on the KDF9 machine at the National Computing Centre. The availability of time on this machine, particularly at short notice as required for program modification and testing, was low.

4. During the course of the Investigation the NCC KDF9 was sold and it was necessary for the SDI work to be transferred to the machine at Salford University. Here again the general shortage of available time was a problem.

5. Poor housekeeping on a few occasions led to loss of tapes and in one case to loss of the latest edition of a program.

6. Limited availability of time for Mr Price to write program modifications combined with the lack of program testing time on the computer led to accumulation of large amounts of testing with consequent likelihood of failure of the run and consequent further delay.

7. Programming effort was inadequate for maintaining the regular SDI service. Provision of such additional facilities and analytical programs as were desirable for an investigation of this type became virtually out of the question.

The facilities available in the Investigation were therefore fairly limited. These were as follows:-

1) Input of subject-interest profiles having a maximum size of approx 100 terms. (For much of the time, until the limit was relaxed, profiles with more than approx 50 terms had to be input in two portions on successive, normally weekly, runs.)

2) Amendment or deletion of existing profiles.

3) Printout of profile file in full or for particular profiles as required (the latter facility only became available later in the Investigation).

4) Input of document records.

5) Printout of documents in subject categories according to subject headings assigned to each document.

6) Matching of document file against profile file.

7) Printout of the documents matching each profile, either the document numbers only (General Matching Output) or full document details (Additional Matching Output).

8) Printout showing, for each profile, all the documents with which it had at least one descriptor in common and the actual descriptor(s). (Special Matching Output).

9) Input of descriptor terms to form or add to the Descriptor File.

10) Printout of Descriptor File.

With these facilities it was possible to provide the SDI service to participants in the Investigation. However, certain additional facilities were badly needed. These included:-

1) Printout of Descriptor File showing, for each descriptor, the profiles in which it was used. A great deal of effort was in fact expended on this, including changing all the 600 or so profile numbers. However the only result was that the computer used one set of numbers and every other system a different one, so that the profile identifications had to be constantly converted manually by the IEE staff, from the one numbering system to the other.

2) Usage of descriptors by documents. This information was required to allow analysis of indexing practice and adjustment. This facility was in fact available but there was doubt as to the method used to generate counts of descriptor use.

3) Deletion of unwanted descriptors from the Descriptor File. This facility was supposed to be available but on the occasions it was used a number of deleted descriptors continued to appear on the file. The underlying fault was never diagnosed and therefore use of this facility was discontinued.

The effects of the deficiencies of the service were of course felt in every aspect of the Investigation. As a result the profiles were of a lower quality and less than adequately tested before input, the weekly service was liable to breakdown and delay, fault diagnosis took large amounts of management time and profile analysis was more laborious than necessary. The special analytical programs which had been envisaged originally and which could have helped materially in the general analysis of the system became quite unrealistic in the general context of the computer and programming facilities. Thus, all in all, it must be said that the actual service provided to users was considerably and deleteriously affected by the computer service and, insofar as the Investigation hinged directly on the evaluation of this service, the results of the Investigation may have been seriously affected. Probably the most serious consequence, however, was the necessity for the staff of the Investigation to devote almost all their energies to overcoming the computer service deficiencies and simply maintaining a regular weekly service. This necessary concentration on the running of the service could not but have an unwelcome effect on the investigational aspects of the project.

In order to clear some of the problems of error reports, a meeting was arranged between Mrs. Pendlebury of DPC, P. Clague of IEE, and K. Aspinall of EELM who had been responsible for the programs. Most of the error report problems were cleared up, together with the form of logic statement acceptable in profiles. The input restriction of a maximum of 20/8 characters per field was queried, and Mr. Aspinall offered to remove this limitation.

The possibility of confounding singular and plural in the thesaurus and of automatic amendment of profile terms in the light of thesaurus amendments was discussed, the former being thought likely but not the latter. As a result of these discussions it became apparent that the programs had been written on an assumption that profiles would be uniquely identified by the last three digits of the profile number. While this arrangement could have been adopted in numbering the profiles this requirement was not communicated to IEE by English Electric and the actual numbers assigned did not conform with this requirement.

It was thought by Mr. Aspinall that some three weeks programming effort would be needed to write a program to convert the records from the existing numbers to agreed numbers with the last three digits unique. One other way was, of course, for IEE to re-input the profiles with changed numbers. No immediate decision was taken on this matter since all the possible repercussions on an already extremely tight schedule had to be considered.

The need for an analytical printout to show the use made of any descriptor by any profile was mentioned and Mr. Aspinall agreed to look into this.

A meeting was held on 21 February, 1968 between OSTI, IEE and DPC. The matching of profiles and documents requested in the January meeting (requirement (e) above) had not yet been obtained. Mr. Price stated that one difficulty was that the SDI programs accepted document input only in the form of paper tape and the existing tapes were getting worn. A modification to accept magnetic tape would require one man/week's programming time. IEE still had no information as to the documents actually accepted on file and DPC offered to provide a document tape edit to give this data.

Full instructions on the input data limitations and format requirements were finally received from DPC on 14 March 1968, thus allowing IEE to prepare paper tapes to an agreed specification. From this date the input error rate dropped steeply. This fact, together with the newly acquired knowledge of the state of the document file (from the document tape edit), considerably eased the problem of profile testing and modification. In spite of all the computer difficulties and consequent serious delay in obtaining test matching output, it was still the aim to start the experimental service period (Phase 4) in April 1968. However, this became completely impossible when in early March the wrong profile update tapes were input by the NCC operators. The resulting confusion, compounded by the poor record keeping which had been primarily responsible, continued throughout March and most of April and during this time no matching output could be obtained or new profile data input. The problem of clearing these troubles was made worse by the lack of available time on the NCC machine, a waiting time of one week being common at this time.

After almost two months, during which no usable output was received, a successful run was made on 30 April, 1968. This run finally incorporated the profile modifications which had been accumulating over the whole of these two months and produced matching output. However, in a number of cases more than one modification had been made to a profile in that time. Where this had happened the programs accepted only one modification and produced output on the basis of that modification and ignored any other. It was, of course, unfortunate that the choice of modification was random and that there was no way of discovering which one had been accepted, short of checking a printout of the profile file.

On 22 May 1968 IEE queried the status of the programs for converting the profile numbers from the existing ones to one with unique last three digits. DPC reported that this program might work given optimum conditions but that modifications were being made to take care of likely problems.

At this time IEE were concerned about the layout of various printouts e.g. Bulletin output and General Matching Output. These had been specified to DPC on 5 March 1968 but no action had been taken.

Throughout May and June the computer service improved very markedly both in frequency, reliability and speed of turn-round. This was just as well since Phase 4 in which users received sample service had now started. Massive effort was being devoted to establishing the exact edition of the profiles actually on file, evaluating the test matching runs, modifying as necessary, re-modifying and re-testing, and finally passing the profiles for service. Even at this stage, however, there remained uncertainty as to the exact limitations on the size of particular parts of records and these limits were transgressed occasionally as profile records increased in size.

Full information on the size limits for various parts of the records was not received until July 1968. Computer service during this period continued to be fairly satisfactory and it was possible to provide an experimental service to most users. However, a number of inadequacies in the programs continued to be discovered and to cause trouble. In particular, modifications to some profiles were being rejected for no easily apparent reason. This resulted in a core of untested and unimproved profiles which could not be put into experimental service.

On 10 September 1968 the status of the re-numbering programs was that they appeared to work but that the print program was not yet functioning and therefore there was no easy way of checking the programs.

For the last two weeks of September, no output was received from DPC. This turned out to be due to Mrs. Pendlebury's absence and the fact that nobody else had been deputed to deal with the work. On her return the accumulated tapes were run but a failure occurred for an obscure reason which could not be dealt with in Mr. Price's absence. These tapes were finally run on 8 October - giving a total of a month in which no output had been received from DPC.

Since the start of the operational period (phase 5) was scheduled for 1 November 1968, there was considerable anxiety about the computer service.

A letter from IEE dated 7 October summarized the requirements to be met before 1st November. These included:

a) Re-numbering programs to be completed and checked, and the re-numbered files to be in operation.

b) Bulletin output to be produced on litho masters as a test.

c) Assurance of a regular weekly computer service with a rapid turn-round time.

In a telephone conversation on 22nd October 1968, Mr. Price promised that the re-numbering would be carried out as soon as possible and no later than the end of October. It was agreed that work on this should be given priority over that on residual program errors. IEE promised to send punched paper tape incorporating the necessary re-numbering data for a quarter of the profiles. These were despatched the same day.

At this period (October 1968) shortage of computer time became acute and this situation was not helped by the fact that a large number of modifications had now accumulated. As a result of this shortage of computer time, profile modifications despatched on 16th October were not matched until the 29th, by the same run used for testing the modified programs and the re-numbering program.

In spite of all the computer problems it was felt to be of over-riding importance to start the weekly SDI service to users as soon as possible, and this was done at the beginning of November 1968. All in all, the minimum service of providing the matching output each week was maintained with varying turn-round delays. However, attempts to obtain improvements on this very basic level of service were unfruitful.

By the end of November 1968 no further progress had been made on profile re-numbering and various program modifications largely, as always, through lack of computer time and the absence of Mr. Price, the only person at DPC able to handle the SDI programs. His visit to the USA meant that no progress could be made for the whole of December. This, of course, entailed at least one month's extra delay to the SDI Investigation's proposed schedule since it was agreed that Phase 5 (operational service period) could not officially be considered to have started until the re-numbering programe and the various other program modifications had been completed.

In conversation with Mr. Price on 7th January 1969 it was learned that the re-numbering program was considered to be about two-thirds operational. The main reason for the delay in its completion was turn-round time of about a week for program testing. The other program modifications were being input and tested on the same runs.

At this stage the NCC KDF9 was being sold to the National Physical Laboratory and negotiations to use the Salford University KDF9 were proceeding. However it was thought that the NCC machine would be available for the SDI work until June/July 1969.

On 13 February it was learned that NCC had lost the latest version of the program test tape, with the result that it was having to be rebuilt from an earlier version to include all subsequent amendments. Two weeks had been spent on this and another two were expected to be necessary. All work on the re-numbering program and program modification had to be delayed while the tapes were reconstituted. No indication could be given as to when these modifications would be complete.

At this stage the earliest possible date for start of Phase 5 was 1 April 1969. As even this date became less and less likely the IEE became very concerned and made very great efforts to clarify the possition and to seek, in consultation with OSTI and DPC, ways to minimize further delays. (Copies of relevant memoranda, letters and minutes of a meeting of 10th April are shown in Appendices8A,B,C, & D).

Further meetings between IEE, DPC and OSTI, arranged for 24 April and 28 April 1969, were cancelled at the last minute.

On 30 April 1969, IEE received printout of a re-numbered profile file incorporating profiles for which data had been provided by IEE on 22 October, 1968 and 3 January 1969. Several days later a second printout arrived showing the use made of the Descriptor File by profiles within the range covered by the tapes sent to DPC in October 1968.

In the light of these successful printouts it appeared reasonable to expect that a completion of the re-numbering of the complete file would be no more than a few weeks away.

A number of changes to profile numbers had occurred since the original tapes were sent, and IEE offered to produce immediately additional tapes to incorporate these data. However it was decided, in consultation with DPC, to defer these until a complete printout had been obtained and checked on the existing profile file.

Trouble still continued to occur in updating profiles, leading to the rejection of apparently perfectly sound modifications. The reason for such faults could only be discovered by someone with an intimate knowledge of the programs. i.e. Mr. Price, and his frequent absences from Manchester entailed considerable delay in discovering and correcting such faults. It was particularly irritating that many of these had been taken care of in the program modifications which had been in process of being tested for approximately six months.

On 2 July, Mr. Price was again asked about the re-numbering program. The three types of error discovered had all been accounted for and completion of the work appeared to be close. The main problem was computer time for testing since a run required three hours.

In the same conversation IEE mentioned the small layout changes required for Additional Matching Outputin order to discover any possible snags before the computer stationery was ordered for this. IEE requirements appeared straightforward to Mr. Price. IEE offered to send full details.

On 22nd July, Mr. Price was again approached about Additional Matching printout in the light of his letter of 15 July. The need for speedy action on this was agreed and in the light of his imminent departure on holiday for five weeks he agreed to make the minimum adjustment immediately. He considered that the re-numbering program, was now working perfectly and the lack of progress was ascribed to a machine fault.

For the last week in July and the first two in August, serious trouble occurred .in running the SDI programs, with the result that no output at all was received during this period. The interrupted service was resumed on 18 August and major efforts were made to clear the backlog.

The run of 11 September 1969 failed as a result of a logic statement error. This fault had been known for some time and a program modification had been written several months earlier. It was not immediately known whether this modification had been tested and incorporated or whether as a result of recent troubles an earlier version of the program was being used.

At this time additional problems began to occur with the changeover from NCC to Salford University. It was found not possible to print out the General Matching (the normal notification to subscribers) in a format to fit the computer stationery so this was provided temporarily on plain paper.

On 3 October Mr. Price was asked by IEE about the Additional Matching Output. This had not worked yet, possibly due to machine faults. The urgency of this output for the various studies and the need to restore the facility for printing out the updated version of profiles after modification was stressed. This latter facility had been available up to the troubles of August but had been lost since then. This left no way of checking the profile updating. The need for a progress report on the re-numbering program was also mentioned.

Thus at the start of the weekly service in November 1969 the situation could be sumarized as follows:-

1) Time on the Salford machine was inadequate except for the regular SDI weekly run and only then if no problems occurred or special requirements were specified.

2) No additional time was available for program testing or for re-run in the event of failure.

3) To minimize the danger of non-arrival of tapes by the scheduled run time, large allowances had to be made, thus causing delay in the service, ie tapes sent by IEE on Friday afternoon were run by DPC on Tuesday evening (four days later).

4) Twenty months after the requirement for re-numbering was accepted by DPC, this work had not been completed. Thus during this whole period the SDI staff used two separate numbering systems for profiles, with all the waste of time and unnecessary complication that this entailed.

5) Analysis based on use of particular descriptions by profiles was still impossible.

6) Program faults causing rejections of profile amendments were still active long after the causes had been detected and in some cases program modifications written.

7) Printout of updated profiles had not been restored after earlier troubles.

8) Additional Matching Output required urgently for several studies was still not available in the format required.

9) Changeover from the NCC KDF9 to the Salford KDF9 was throwing up problems even in the normal operation of the SDI service in spite of the fact that this changeover had been known about for six months at least.

Summary

The foregoing recital of the difficulties encountered in the computer service is necessarily long and complex. It is perhaps useful therefore to summarize the facilities that were available during the Investigation:-

1) Input of subject-interest profiles having a maximum size of approx. 100 terms. (For much of the time, until the limit was relaxed, profiles with more than approx. 50 terms had to be input in two portions on successive, normally weekly, runs)

2) Amendment or deletion of existing profiles.

3) Printout of profile file in full or for particular profiles as required (the latter facility only became available later in the Investigation)

4) Input of document records.

5) Printout of documents in subject categories according to subject headings assigned to each documents.

6) Matching of document file against profile file.

7) Printout of the documents matching each profile, either the document numbers only (General Matching Output) or full document details (Additional Matching Output).

8) Printout showing, for each profile, all the documents with which it had at least one descriptor in common and the actual descriptor(s). (Special Matching Output).

9) Input of descriptor terms to form or add to the Descriptor File.

10) Printout of Descriptor File.

With these facilities it was possible to provide the SDI service to participants in the Investigation. However certain additional facilities were badly needed. These included:-

1) Printout of Descriptor File showing, for each descriptor, the profiles in which it was used. A great deal of effort was in fact expended on this, including changing all the 600 or so profile numbers. However the only result was that the computer used one set of numbers and every other system a different one, so that the profile identifications had to be constantly converted manually by the IEE staff, from the one numbering system to the other.

2) Usage of descriptors by documents. This information was required to allow analysis of indexing practice and adjustment. This facility was in fact available but there was doubt as to the method used to generate counts of descriptor use.

3) Deletion of unwanted descriptors from the Descriptor File. This facility was supposed to be available but on the occasions it was used a number of deleted descriptions continued to appear on the file. The underlying fault was never diagnosed and therefore use of this facility was discontinued.

The effects of the deficiencies of the service were of course felt in every aspect of the Investigation. As a result the profiles were of a lower quality and less adequately tested before input, the weekly service was liable to breakdown and delay, fault diagnosis took large amounts of management time and profile analysis was more laborious than necessary. The special analytical programs which had been envisaged originally and which could have helped materially in the general analysis of the system

became quite unrealistic in the general context of the computer and programming facilities. Thus, all in all, it must be said that, the actual service provided to users was considerably and deleteriously effected by the computer service and, in so far as the Investigation hinged directly on the evaluation of this service, the results of the Investigation may have been seriously affected. Probably the most serious consequence, however, was the necessity for the staff of the Investigation to devote almost all their energies to overcoming the computer service deficiencies and simply maintaining a regular weekly service. This necessary concentration on the running of the service could not but have an unwelcome effect on the investigational aspects of the project.

Chapter 9

PROFILE ANALYSIS AND MODIFICATION

By 3 November 1967, 202 profiles had been compiled. This was good progress, particularly bearing in mind the lack of a full complement of staff from the start of the Investigation in July. By March 1968 virtually all of the 570 individual user profiles had been compiled.

Apart from the central difficulty of learning how to render often complex research interests in an SDI profile, the initial task of profile construction was complicated by:-

1) A thesaurus which had to be developed concurrently with profile construction. Thus, as the thesaurus expanded to include terms needed for new profiles and for document indexing the earlier profiles required to be updated to take account of the expanded vocabulary.

2) The inability of the computer service to allow testing of draft profiles and to give experience of the interplay between document indexing and profile compilation. Only when the bulk of the profiles had been compiled did this data become available.

One of the major problems in profile analysis and modification for a long time was that no record was obtainable showing which of the documents input to the test collection had in fact been accepted on file and were therefore available for matching. It was not until the end of February 1968 that this data became available.

Tests of draft profiles

The draft profiles were tested by matching them against a test collection of some 700 documents which had been indexed and input to the computer in the period September 1967 - February 1968. Here again the thesaurus had developed quite considerably in the interval between the indexing of the first documents and the last ones, and the indexing was not therefore in any way uniform.

However the purpose of these first tests was not to establish accurate performance figures but to gain some idea of how well the profile was performing and what modifications were necessary before it could be considered ready as a basis for experimental service.

Test method

The test collection of documents were selected from readily available core journals in electronics e.g. IEEE Transactions, IEE Proceedings, Electronics Letters, J. Applied Physics and some of the Russian cover-to-cover translations in this field. It therefore covered a large number of the topics in the profiles but no attempt was made to ensure a representative sample to cover all topics.

Each article was assigned to up to three out of approximately 15 subject headings and lists were typed and duplicated of the documents assigned to each subject heading.

Sets of subject lists appropriate to the user's interests were then sent to him with a request that he should mark with a tick any articles of relevance and with a question-mark any of possible interest but whose relevance could not be ascertained from the information given.

This was our first taste of serious misunderstanding since, though our covering letter expressly stated that this was for test purposes and was in no way the SDI Service, a number of users commented on the "service". Some were highly critical as was only to be expected since in many cases it was likely that out of 200 articles only one or even none would be relevant. More surprisingly some users were happy with what they had received.

The marked documents on the lists were taken to be the relevant documents in the system. Those ticked were taken to be the relevance '1' documents and those with a question mark as approximating to relevance '2'. All unmarked items were considered as not relevant.

Comparison of these with the document selected by the profiles provided figures for Recall 1 (relevance '1' documents and relevance '2' documents combined), and Precision (relevance '1' and '2' combined). Any documents selected by the profile but for which we had no relevance assessment (i.e. they had not been included in the document lists) were ignored in arriving at precision figures.

Figures achieved at this stage were (20 per cent sample - universities):

Recall 1	Recall 1/2	Precision
42%	42%	60%

First analysis and modification

After analysis and modification the figures had been raised to:

Recall 1	Recall 1/2	Precision
72%	58%	61%

It was considered, on the first test results, that, though there was obviously room for improvement, particular attention should be paid to improving Recall and in particular Recall of relevance '1' documents since these represented documents of real interest. The reason for concentrating on Recall was that it was felt an initially somewhat over-broad profile would show its faults in the Precision returns and could be adjusted. A too-narrow profile on the other hand would not be self-monitoring in the same way since it would not be so easy to decide what was being missed. In addition, of course, the poor Recall figures were in some part due to changes in the thesaurus since the profiles were compiled.

As can be seen from the figures a great improvement in Recall was achieved while holding the Precision at the same level. This was not the maximum improvement possible since a level of performance equivalent to approximately 60% Precision and 60% Recall had been set as the pass line and profiles reaching this level at Test 1 were not, in general, modified further. Some five of the forty profiles in the sample were of this type.

To some extent the improvement in performance shown by the figures is illusory since at this time the analysts knew which documents were relevant to each profile and were able to modify to ensure that these were retrieved. However they were instructed not to modify in this narrow way but to ensure that the modifications were consonant with the users' original stated requirements. While it was expected that the performance figures obtained in this second test would be artificially high, some of the increased performance and the shift toward better Recall would be maintained.

As mentioned earlier the level of performance required of a profile before it could be considered ready for the experimental service was that the figures for percentage Recall and Precision should, when added, total more than 120. For example 60 per cent Recall and 60 per cent Precision or 100 per cent Recall and 20 per cent precision. However, the danger of extreme figures was realised and an attempt was made to bring each figure more into the middle of the range. Emphasis was placed, as mentioned earlier, on Recall so that, though a profile giving 90% Recall and 30% Precision would be accepted, one with the figures reversed would be modified in an attempt to increase Recall.

To some extent, of course, the level of performance taken as acceptable was arbitrary and, though based partly on earlier experience in the manual system and an idea of what users might consider acceptable, was largely a way of deciding those profiles which most needed attention within the limited time available before the start of the experimental service.

Experimental Service

Some profiles were still unsatisfactory after modification and second test and in some cases further modifications were made and tested. However, it was not possible to bring all profiles up to the stated level of performance before they were used for experimental service. There were various reasons for this. The test collection did not provide sufficient data for a number of profiles in the more fringe areas of the field and optimization on such data would have been unwise. Other profiles remained poor performers after all efforts to improve them and it became necessary to seek additional information by putting them into experimental service.

139 of the 181 university users received output for the first experimental service run.

Average Precision for these (20 per cent sample) was 62 per cent, taking relevance '1' and relevance '2' documents. (Figures calculated as average of ratios).

133 of the 193 government users received output from the first experimental run, and 109 out of 191 of the industrial users.

Thus, by the end of June 1968 some 381 profiles had been put on field, tested and had generated a first set of experimental notifications for their users.

The relevance returns for these notifications were monitored and action was taken to improve precision where this appeared necessary and possible.

At the same time a considerable amount of work was being done on compilation of new profiles and on testing and modification of profiles which had not yet been passed as satisfactory for experimental service. To a large extent the delay in getting profiles into the experimental service was due not so much to inadequacies in the profile and the consequent need for modification but to delays in obtaining test output from the computer. These were due to a number of reasons including data preparation errors, occasional abortive runs, and delays in setting up a run. In addition the error reports were somewhat cryptic, causing difficulty and delay in locating and correcting the faults.

However, major efforts were made to clear the errors that had been preventing acceptance of original and modified profiles and the number of profiles tested and ready for service grew quickly:

Profiles ready for experimental service

22 May	273
28 May	344
6 June	379
11 June	399
21 June	440
10 July	496
6 August	534

Performance in Experimental Service

In order to gain some idea of the Recall performance of the profiles, partial lists of the articles input to the first four series of experimental matching runs were sent to users with a request that they should mark any items which their profiles should have selected.

The results of these showed Recall (for the same 20 per cent sample of university profiles) to be approximately 55 per cent while Precision was 71 per cent. Though some of the improved Recall after test 2 had been lost, obviously a considerable real increase had been achieved over test 1 without any sacrifice of Precision.

As before, a level of acceptable performance similar to the previous one was set, though this time the dangers of very low figures for either Recall or Precision were realised and in general a minimum figure of 40 per cent for either value was set. Once again particular attention was paid to Recall.

Preparation for operational service

A target date of 1 November had now been set for commencement of the weekly service and time was extremely short for carrying out all the testing, analysis and modifications desirable by that time. Consequently it was only possible to analyse and modify obviously inadequate profiles and many acceptable profiles could not be given the small amount of attention which might have served to improve them considerably.

The marked-up lists began to be sent back by users about mid-August which, of course, left little time for analysis and modification before the start of the service. Some profiles however had not been put into service until run 3 of the seven experimental runs. To obtain sufficient test data it was necessary to send to these users, document lists of runs 3 - 6 inclusive. In addition, for some profiles, the test data from runs 1 - 4 had not been sufficient and it was necessary to send listings for runs 5 and 6. In general where there were fewer than twelve known relevant documents for the tests on runs 1 - 4, additional listings for runs 5 and 6 were sent. Five and 6 listings were also sent to users whose profiles had been modified as a result of the 1 - 4 analysis, in order to assess the effect of these modifications.

The 5/6 listings could not be sent out until mid-October so that much of the resultant analysis and modification could not be done before the start of the weekly service in November. Thus, in the first month or so of regular weekly service many users were receiving service on profiles which were as yet relatively untested or known still to be unsatisfactory. This state of affairs must be attributed to lack of one analyst/indexer for the preceeding twelve months of the Investigation and to delays in achieving a satisfactory computer service. There is no reason to suppose that, without these handicaps, virtually all profiles would not have been in a properly tested and modified state by 1 November.

It must also be remembered that the experimental service period, originally planned to last six months, in fact only lasted from May 17 (when the first notifications were despatched) to 1 November, i.e. five-and-a-half months, and covered the main holiday period when interaction with the user, vital for profile evaluation, was most subject to delay. The start of the regular service could have been delayed to allow more time for profile modification but it was felt essential to start providing the service which had been promised for so long, since there was a grave risk of the users becoming completely disenchanted. This decision was not taken lightly since the inevitable result was that effort needed for profile testing and modification was diverted to indexing and other activities associated solely with provision of the service. This meant, of course, that the loss of time during the experimental service could not be made up by equivalent time during the operational service.

Weekly operational service

After the weekly service had been running for a few weeks document listings were again sent out in an attempt to assess the recall of the system. Performance figures for this run (014) were Precision = 70 per cent (average of ratios for 104 profiles, i.e. approximately 20 per cent sample); Recall = 59 per cent (average of ratios for 207 profiles).

Some profile modification was done on the individual profiles where the Recall figures seemed to be extremely poor, but it was decided that for various reasons no overall analysis should be attempted. The reasons were as follows:

1) It was essential that the profiles should be brought to a reasonable state before the operational service, but thereafter they should be left to operate undisturbed unless there were compelling reasons for modification.

2) Time could only be devoted to large-scale modification at the expense of other more general analysis and it was considered important to discover general effects rather than tinker with individual profiles.

3) There was some reason to fear that a "swings and roundabout" effect was beginning to show, with modifications largely changing the balance between Recall and Precision, but with no overall gain in performance.

4) The true worth of the data used for analysis was in question. It was felt particularly that the list markings did not precisely and consistently indicate the documents pertinent to the users' interests. Considerable variations were known to occur between notification markings and list markings. Until the extent of these variations and the relevance ratings of the items marked could be assessed, further work based on this data was considered unwise.

5) All our profile compilation and modification so far had been aimed at a general profile standard giving a balance between Precision and Recall of approximately 65 per cent Precision and 65 per cent Recall. Even assuming that users, given the choice, would have preferred this type of performance, there was no reason to suppose that they would have calculated these figures on the same basis. For example in determining Precision we took both relevance 1 and relevance 2 documents notified as a proportion of total notifications. However for a user whose notifications consist mainly of relevance 2 and irrelevant items, the actual performance of the service depends on the worth of the relevance 2 items.

It had always been accepted that the type of performance required by users would differ from individual to individual and that it was important that profiles should attempt to satisfy individual requirements. It would have been very useful to have had information about the performance requirements of individuals in the early stages of profile compilation but this was not possible since users need experience of an actual SDI service before they can make meaningful judgements of the type of performance they would wish to have from such a service.

Profile questionnaire

After two months of weekly service a questionnaire was sent to users to ascertain, among other things:-

a) The degree of satisfaction or dissatisfaction with the service. To a large extent this was the main purpose of the questionnaire since it was important to know if any significant proportion of the users were sufficiently dissatisfied that they were liable to drop out. This also had the advantage that it indicated rapidly, without the need for time-consuming analysis, those users who were receiving unsatisfactory service and whose profiles needed attention.

b) The aspects of the service which appeared least satisfactory. This was particularly valuable for users on the fringe of the field who were dissatisfied with Recall. It was possible to assess the extent to which this was due to inherent limitations of the service, e.g. limited subject coverage. As a result we were able to explain the reasons for poor performance and suggest that users might wish to opt out where further participation seemed unlikely to be rewarding.

c) A more precise idea of the importance of the items marked "2" on the relevance returns.

d) The number of relevant articles thought to be published in the user's subject field each year.

e) The type of performance which the user would like his profile to provide.

Of the users who replied some 12 per cent considered the service they had been receiving Poor or Very Poor and these profiles were given urgent attention to determine what the faults were and how they could be eliminated.

The questionnaire is shown in Appendix 9A.

At this stage it was becoming clear that the performance figures gave only a rough indication whether a profile was operating to the satisfaction of the user and that very considerable effort was needed to monitor over 500 profiles and to analyse the reason for low performance. In particular it was clear that the samples of documents used for determining Recall performance were far too small for effective judgements to be made of the Recall performance of individual profiles and any attempt to adjust individual profiles of the basis of the figures was likely to be dangerous.

In general it is true that data for assessing Precision performance is much more readily obtained and reliable than that for Recall. More particularly, the user of an information system is much more directly aware of poor Precision than of poor Recall. From the practical point of attempting to satisfy customers it is undoubtedly more rewarding to concentrate on good Precision than on good Recall which it may be difficult to assess in a way that is relevant to the user's real needs.

Given that the effort spent on improving Recall was not proving particularly fruitful and also that limited time was available for profile analysis and modification it was decided that greater emphasis should be placed on improving Precision. From about week 030 in general efforts were made to reduce the amount of time spent in routine analysis and modification and to concentrate on profiles which obviously were performing badly or which were the subject of comment by participants.

In this connection it should be pointed out that all comments by participants were scrutinised immediately on receipt and action taken to adjust the profile as appropriate without delay. As a result the profiles of the most reactive participants received very much more attention than the average. Thus some profiles were modified as many as five or six times within the 12 months while others remained unaltered.

Time spent in analysis and modification

The reasons for analysing the performance of a profile and attempting to modify it were numerous:

a) User dissatisfaction

The simplest way for a user to draw attention to unsatisfactory service was to put a tick into the box at the bottom right hand corner of the relevance assessment return. Monitoring of all returns ensured that these particular profiles could be examined urgently.

b) User comment

Users were encouraged to use the back of the relevance assessment return for any comment whether in conjunction with the 'dissatisfaction box' or not. Again all returns were scrutinized for comments and immediate action taken. Such comments could take many forms but normally explained why particular items were considered irrelevant, or defined the user's interests more closely, or asked for additional subjects to be included in the profile.

c) Performance of the profile appeared to the SDI staff to be below average.

The Precision performance of each individual profile was the responsibility of a particular indexer/analyst who monitored its performance. In addition the clerk responsible for recording the relevance returns drew the attention of the indexer/analyst to any profile which appeared to be performing badly.

d) Questionnaire returns

The questionnaire sent to users immediately after the start of the weekly service was intended, among other things, to discover which profiles were performing unsatisfactorily. All profiles of users who assessed the service Poor or Very Poor were examined urgently and later all those of users who assessed the service as Fair.

The analysis and modification done to the profiles is summarized in Appendix 9B.

In column 1 is given the serial number of the profile and in column 2 the reason for the analysis. Most of the reasons are self-explanatory except perhaps 'Routine' which means that the analysis was carried out as a regular part of the business of performance monitoring.

All profiles were, of course, monitored in this way. Only those whose Recall or Precision performance was considered unsatisfactory on the basis of the figures were analysed. This explains why some profiles are shown as having had no analysis or modification done to them.

Column 3 of Appendix 9B gives the week in which the modification took effect and column 4 the purpose of the modification, R meaning the modification was aimed mainly at improved Recall, P at improved Precision and R/P a general improvement to increase both Recall and Precision. Column 5 gives the time taken for the combined work of analysis and modifications. In column 6 is given the user's assessment of the service he was receiving approximately two months after the start of the weekly service and again some twelve months later after all the analysis and modification of his profile. The abbreviations used are VP - Very Poor, P - Poor, F - Fair, G - Good and VG - Very Good.

Chapter 10

INTERACTION WITH PARTICIPANTS

In any investigation which involves the voluntary participation of outside people, the mode of interaction with them is important. Given the prolonged regular assistance needed from participants in the SDI Investigation, the establishment and continuation of good relations with them was vital to the project.

In the discussion of the sample of people used for the Investigation, mention has been made of the problems associated with drawing a large random sample and the difficulty of ensuring that the final sample, allowing for expected wastage, would be large enough for all requirements. In these circumstances it was essential to ensure that ill-considered action on the part of the investigators did not precipitate loss of participants.

When it is considered how many individual actions were required from participants and the fact that for the first 12 months or so many of them received very little useful service, the temptation to drop out and thus save time for other purposes must have been very strong.

The fact that such a large proportion of participants continued to the end can be attributed to various causes, but undoubtedly the generosity of the participants in responding to an appeal for assistance in an investigation must be among the chief of them. At the same time the staff of the Investigation were well aware of the need to retain the goodwill of participants and to simplify and minimize the work required of them.

In particular very great effort went into the drafting of letters to ensure they were clear and concise. As far as possible preprinted forms were supplied for replies and in all cases where a reply was required, a business-reply envelope was enclosed.

The art of persuading participants to devote time to answering yet another set of questions, while retaining some goodwill for the next time, is not an easy one but the problem is common to most investigations, many of which have little else in common. This aspect of an investigation is often ignored in the final report, with the result that the art is not furthered and each investigator sets about the task from scratch.

In the hope that they may be of use to others the letters sent to participants during the investigation are given in the Appendices. Since a very great deal of the Investigation directly involved participants, the Appendices give a general synopsis of the course of the work.

Appendix 10A(1) Letter accompanying the questionnaire, Survey of Information Use by Research Workers. The letter was sent to several thousand randomly selected electronics research workers. Those who replied became eligible for further selection to form the User and Control Groups for the SDI Investigation.

(2) Survey of Information Use questionnaire.

(3) Follow-up letter

(4) Invitation to research workers to take part in the SDI Investigation

(5) Explanation of the SDI Investigation and the work involved for participants

(6) Statement of Information Requirements form

(7) Sample statement

(8) Invitation to librarians and information officers to act as Project Associates in the Investigation

(9) Role of the Project Associate

(10) Notes for the Project Associate on the selection of User and Control groups

(11) Description of the SDI Investigation

(12) Follow up to letter of invitation to research workers

(13) Letter seeking clarification of information requirements (sent to approximately one quarter of participants in connection with investigation of profile compilation methods)

(14) Reply form for above

(15)
(16)
(17) Letters asking participants to mark list of documents for initial testing of draft profiles. (The exact form of the letter received by each participant depended on how early he joined the investigation)

(18)
(19) Notes on Initial Assessment of Relevance (The form of the notes differs depending on the size of the test collection of documents at the time)

(20) Reply form to accompany Initial Assessment of Relevance

(21) Request for relevance assessment of second set of documents

(22) Reply form for above

(23) Letter to participants asking them to check the draft profiles (sent to sample of approximately one quarter of participants. See note on Appendix 13 above)

(24) Reply form for above

(25) Letter arranging visit to discuss profile (sent to approximately one quarter of participants (see note to Appendix 13 above)

(26) Reply form for above

(27) Letter confirming visit

(28) Letter seeking relevance assessments of a further sample of documents

(29) Follow up letter chasing non-return of previous relevance assessment

(30) Thank-you letter acknowledging return of
(31) relevance assessments
(32)

(33) Invitation to Group participants

(34) Explanatory notes on Group participation

(35) Information Requirements for Group and questionnaire on its members

(36) Acknowledgement of Information Requirements from Group participants

(37) Follow-up letter chasing non-return of relevance assessment

(38) Follow-up letter chasing non-reply to draft profile

(39) Follow-up letter chasing non-reply to queries on profile

(40) Letter to Project Associates informing them of start of experimental service and asking whether notifications should be sent via them

(41) Reply form for above

(42) Letter accompanying first experimental notifications
(43) (later version was sent to participants receiving first notifications some way through the experimental service period)

(44) Explanation of relevance assessment markings for
(45) SDI notifications (second version for participants making returns via Project Associates)

(46) Letter to Project Associates, accompanying first notifications

(47) Letter to Project Associate, accompanying second batch of experimental notifications

(48) Request for relevance assessment of sample list of documents included in first experimental service runs

(49) Letter to Project Associates explaining relevance assessments

(50) Letter asking participants for relevance assessments
(51) of sample lists of documents input to experimental service runs.

(52) Letter asking for further relevance assessments
(53) of sample lists of documents

(54) SDI Newsletter intended to inform participants of the progress of the Investigation. For various reasons no later issues appeared

(55) Letter seeking clarification of participants' reasons for marking particular documents as relevant

(56) Letter seeking relevance assessment of additional documents selected from test matching run by revised profile

(57) Follow-up letter chasing non-return of relevance assessments on document lists

(58) Covering note to Project Associate accompanying 'chaser' letters

(59) Letter to participants who had failed to send in relevance assessments for experimental SDI notifications

(60) Reply form for above

(61) Letter asking Project Associates whether weekly notifications should be routed via them to participants

(62) Reply form for above

(63) Note accompanying first notifications on new preprinted two-part computer stationery

(64) Note accompanying supply of business reply envelopes to Project Associates

(65) Note requesting certain participants to return relevance assessments direct rather than, as before, via Project Associates

(66) Explanatory letter accompanying first weekly operational service notifications

(67) Letter asking participants for relevance assessments of sample list of documents

(68) Letter seeking further relevance assessments

(69) Letter to Group coordinators seeking relevance assessments of sample lists of documents

(70) Letter accompanying SDI Service Questionnaire

(71) SDI Service Questionnaire intended to discover reaction of participants to the first two months of weekly service

(72) Letter to participants who had not sent in relevance returns for some considerable time and whose continued participation was in doubt

(73) Reply form for above

(74) Reminder to participants who had not sent in returns for a month or so

(75) Letter replying to particular comments on the SDI Service Questionnaire

(76) Note explaining presence of older material in notifications

(77) Letters seeking data for study on variations
(78) in the marking of lists of sample documents

(79) Letter accompanying sample list of documents for relevance assessment

(80) Notice of termination of service to participants who failed over a long period to send in relevance returns

(81) Covering letter for first notifications despatched to a group of participants joining the investigation at a later stage

(82) Use of authors as search terms - covering letter

(83) Reply form for above

(84) Particularly valuable periodical articles. Accompanying letter for study aimed at discovering the performance of the system for particularly valuable articles

(85) Reply form for above

(86) Notes for study on novelty of information supplied by the SDI Service

(87) Note for study on use made of notifications

(88) Letter accompanying sample list of documents for relevance assessment

(87) Note for study on use made of notifications

(88) Letter accompanying sample list of documents for relevance assessment

(89) Note explaining temporary change of computer stationery owing to transfer of computer service

(90) Letter asking for relevance assessment of sample list of documents

(91) Alternative form of SDI notifications. Letter asking for users' views on the continuous computer printout as compared with the normal cards

(92) Note accompanying card notifications delayed by the above study

(93) Letter seeking assessment of articles selected on the basis of author names

(94) Relevance assessment of full article for use in comparison with assessment based on card notification details

(95) Covering letter for second 'Survey of Information Use by Research Workers' questionnaire despatched towards the end of the SDI Investigation.

(96) 'Survey of Information Use' questionnaire.

(97) Letter informing Project Associates of the conversion of the free SDI Service to a cost-recovery service

(98) Letter to participants as above

As can be seen, approximately one hundred standard letters and forms had to be compiled and despatched to each of the 600 participants. This in itself took a great deal of effort but it does not include the many individual letters that had to be composed and sent to participants to cover particular problems.

One of the chief needs for individual letters arose in connection with the comments received on the weekly relevance returns. This problem was met by having a standard reply letter leaving space for handwritten individual comments by the SDI staff.

It cannot be sufficiently emphasised that an SDI Service is not a single entity but merely the sum of all the individual services provided to the individual customers. interaction with the customers en bloc is only possible to a limited extent and one must always be prepared to give special treatment to smaller groups or individuals, though this is inherently expensive in time and money.

Within the limits of the time and staff available it is considered that the interaction with participants was successful and that this is shown by the cooperation received throughout the Investigation and by the relatively low drop-out rate of participants.

The elements that are thought to have contributed to success are:

1) Considerable attention to the composition of letters

2) Individual addressing of communications

3) Personal signing of most letters

4) Provision of reply forms in almost all cases together with reply-paid envelopes

5) 'Chaser' letters where practicable enclosed a second copy of the reply form to avoid recipient having to find the original

6) Immediate scrutiny by the Investigation Manager and acknowledgement of all comments and complaints

It is likely, on the other hand, that many aspects of our interaction could have been improved. One that we are aware of is the extent to which participants were kept informed of the general progress and results of the Investigation in which they were naturally interested. An attempt was made to achieve this by means of an occasional Newsletter, but this fell victim to the need to spend available time on more immediately pressing matters.

Taking all things into consideration it is considered that the interaction with participants was satisfactorily done and could only have been significantly improved by having a larger number of staff engaged on the investigation or by a small number of participants.

Chapter 11

USER COMMENTS ON THE SERVICE

Towards the end of the SDI investigation after participants had been receiving service for over 12 months a final questionnaire was sent to them to discover their views on the service they had each received.

In addition to specific questions on various aspects of the service, participants were asked to give any general comments they wished to make on the service or the investigation in general.

A considerable number of people took advantage of the oportunity to amplify replies to particular questions and to comment on the service as a whole.

Owing to the varied nature of the comments, no attempt has been made to sort and classify them. They are given below, arranged under the serial number of the participants.

Since the questionnaire appendix was sent immediately after participants had been informed that the free SDI Service was being converted to a cost-recovery service, the comments naturally in many cases mention cost factors associated with a subscription to the service.

007

The most useful improvement would be to have the profile updated, say, every four months or so.

011

1 I think it would be useful if "inhibitor keywords" could be implemented in the scheme more quickly, e.g. for a long time I received notification of superconducting films inconnection with my work (which are to me quite uninteresting): it would have been nice to exclude this category.

2 I think any comments, objections etc. are irrelevant because in spite of any disadvantages this type of system must inevitably replace the old technique of trying to scan all journals etc. personally since it has become an almost impossible task from the time required.

015

It does not absolve one from reading all of the journals that normally publish papers in one's own field. One has to buy some (as many as possible) of these anyway for one's own reference library. References outside this field by SDI were relatively few.

022

The service was most satisfactory on the whole. My profile was only modified when general modification lists were issued. I would have preferred this to be more frequent in retrospect although I did not really notice changes at the time. My cessation of use of this service is due more to my research being ended rather than a lack of desire to continue with the service, although I doubt if "Which" would term it "exceptionally good value for money" at £45 p.a.

123

Some of the articles I have been advised about have been useful to members of my group who might not otherwise have heard of them. In this respect the impact of the service has been widened.

024

I am sorry that I cannot spare time to give considered answers to all the questions on this form. But here is a general comment. My general standpoint is that the SDI system seems to be a good idea. Its plan is quite reasonable on and the results have come up to expectations. BUT the question, of course, is "Does it fill a real need and who has that need?" The positive answer will come from others no doubt. For those of us in the fortunate position of having acess to a University Library and of being a member of a research team engaged on rather specialized work, the need does not seem to be great. The point is that the number of journals in which relevant articles appear is small and we have access to them all anyway. To be honest, SDI has not drawn my attention to any article which I would not have picked up in the ordinary way. So I must regretfully report that, although the system is sure to be attractive to many, it would certainly be an unnecessary luxury as far as I am concerned.

029

The service allows me to see relevant literature when often I am really too busy to expect to know of any.

031

The SDI Service is too limited. My usual requirement (and I'm sure this will apply to many other people) is that, given a new topic or some particular aspect of a topic, to obtain all relevant articles published to date on that subject. The present method is to scan through the abstracts journals, and although this does consume a little time it is satisfactory. It ought to be possible to use the computer to do such a search in a similar way to that which you presently use, but, of course, on a larger scale. However, I do appreciate that a vast amount of literature has been published in the last 30-40 years; but even so I think that an SDI service offering a literature list of relevant articles published over a limited number of years would be more valuable than the service offered at present.

036

With regard to question eight, it would have been more satisfactory in the early stages to have better checks on whether relevant articles were being missed.

040

I am not joining SDI system, not because I don't think it a good idea but because in the university environment we already have good library facilities. I support the idea for industrial use because of difficulty in scanning many periodicals and because of time factor.
Suggestion: overprint back of card so that an integrated filing system can be built up. Some work study could be done on this aspect.

047

If the services included those items listed under question 7 then to an individual the cost of the service I would have expected to be equivalent to the fees charged by professional institutions for membership (£5-£14) a year, with an entrance fee to cover initial profile data.

052

I can only repeat that I feel that an abstract is essential. I would like to thank you for letting me participate in this experiment. I have found it most illuminating.

053

In general the service was satisfactory. Peripheral

articles tended to be missed but this was probable due to the difficulty of including all aspects of one's interests within the profile.

065

We should have a statement of our profiles every 3-4 months and form for amending it - many requirements change and we don't really know exactly what the profile consists of altogether.

We should have a listing, by subject headings, of the author and title only of those items we have marked "1" and "2" every three-four months, and we could quickly and easily scan and review the recently notified articles of interest in a particular subject - cards get bulky.

067

Under (11) what do university research groups do? Either the service is very expensive or one writes a group profile which seems to me to stretch the rules.

More selectivity seems to me essential - otherwise one gets snowed under with trivia.

072

I believe that a service of this kind is only justifiable for a research worker with enough time and incentive to follow up the notifications. The profile should be highly specific. Some way must be found of keeping the cost in proportion to an individual's work to his department. Once SDI is well established I imagine group subscriptions could be instituted - eg an Institute pays £5 pa for a number of individual workers (this number fluctuating in any one year).

For my own type of job (which I won't attempt to describe) one is liable to be confronted with a technical qestion suddenly and therefore to want a survey. I should like to be able to ring up someone and say:

1 Can I now obtain a low noise MOS transistor cheaply in this country and if so from whom?

2 I should like to know of all theoretical papers on "Cockfoft-Walton" type cascade voltage multipliers.

078

The service improved appreciable over the years:-
Initially it notified me of uninteresting articles.

Finally it notified me when a journal of interest to me had been published.

In its present state the service provides valuable back-up, but I would not only rely on it to keep me in touch with the literature.

I sometimes wonder whether the feedback mechanisms, between user's interests and his profile in the machine, is stable. In my case I think it has been but I can imagine the possibility that the profile might encourage a user to spread his interests more and more widely/thin.

092

The service in general was very useful. The main problem is in the user defining his profile. There are always papers whose title content cannot be predicted and may not fit into the profile but be of interest. For this reason it is still necessary to occasionally scan the publications personally to ensure that nothing of interest escaped the profile.

095

I found the coverage good when it comes to deal with a fairly wide and well defined subject (superconductivity). It was inadequate when dealing with a fraction of a field (thin films) although in fairness I doubt whether I defined my fractional interest well enough. This was due both to difficulty of definition and to the fact that my interest shifted with time. The last comment is an important reason why I prefer to use CPP: the scope of my interest can be varied with time and I know what I have left out at any given time. The other reason is, of course, cost.

It would be very useful to be able to abtain notification of all articles published over a certain period of time, the past two years for example, by a specified author or groups of authors, or from a particular organisation, or on a particular narrowly defined subject field, etc. (I appreciate, of course, that an extra charge would have to be made for such a service).

098

My particular interest is peripheral to normal requirements from SDI, but it is certainly useful, therefore my comments are perhaps abnormal. Main problem is that of missing substantial number of articles. Has my letter to you of 21st January, 1970 helped in formulating more satisfactory profile.

I think it important for users to check over their profile regularly - say every three months, to combat the problem of missed articles. The most important factor - to me anyway - of such a service is to be certain as possible that all relevant articles in the journals scanned are notified. If this problem were solved the service would be invaluable.

099

In reply to Question 11 my exact position is this:-

1 I would have liked to subscribe

2 Funds are very limited at the moment

3 Hence I would prefer £35 worth of equipment for research than the SDI service.

4 I would be prepared to sacrifice up to £10 worth of equipment for the service at present.

5 In normal financial circumstances at the college I would have subscribed in view of the time saved.

6 I can get the information I need either from the college library or Patents' office library and although this takes longer it does not cut into the research grant.

7 A group subscription was considered out of the question as the interests of my colleagues are too diversified.

101

As mentioned in answers to question 2, I have received rather a lot of notifications of papers on semiconductor physics - effects of doping, group III-V material etc. - whereas my interests are only on the application of devices in circuits and circuitry.

103

Too many sources of papers in my research field were not scanned.

105

I feel the service is usefule for fringe topics but the main articles on cosmis ray air showers do appear in the Proceedings of the Biennial IUPAP conferences which I normally purchase.

As I commented earlier, I am interested in large detectors of radiations. The profile therefore included radiation

detectors and most of the cards sent to me on this heading were of little interest.

109

1 I think the customer should be invited to update his profile more frequently. An explanation of how each card in any one particular week came to be chosen would perhaps allow the customer to eliminate unnecessary cards by altering his profile.

2 The information given on the card should allow the customer to write away immediately for a reprint.

110

While I received notifications of most of the relevant information there was a preponderance of irrelevant literature. I do not honestly consider that the service I received - useful as it may have been - was worth the amount you propose charging. Inclusion of foreign language reviews is obviously of paramount importance: anyone can scan an English language paper, but how many can scan, as easily, a foreign language paper or report? If anything, I would say that this service would be more valuable than the English-language service given at present.

111

I have found the service of great value particularly for fringe journals that are not readily available. For example our departmental library keeps Physics Review, Jornal of Physics, A B C D E, etc., so I always see these quickly, but I have to go a considerable way to see Australian Journal of Physics, etc., CPP is getting very late now, I regret to say. If they could catch up - that would be the answer.

118

Generally satisfactory, but too many articles of no interest.

126

See earlier - it would be extremely advantageous to have the address to which to write for a reprint on the card - as is done in CPE and CPP.

134

It appears to me that if one's interests are quite specific (e.g. piezoelectric phenomena) then not only is it easy to define one's profile - but all things follow from this.

One then obtains a service that is as good as the number of periodicals surveyed. But clearly it is insufficient to define one' interests in terms of words like "control" "network theory" and "stability of nonlinear systems".

I wonder, too, how receiving a relatively large number of "minor interest" references modified ones future receipts. This could be a divergent process rather than a convergent one.

For myself my interests are fairly wide and I find that a good periodical library visited regularly is preferably my most efficient personal system.

135

I am sorry indeed to see the end of my SDI cards but I do feel strongly that the price either to me or my employer would be too high since this amount can be spent better on buying the journals which are most likely to contain the important information.

137

The service is useful to me but as most of the information I need appears in three journals only, it is no great handicap for me to scan these issue by issue.

On the other hand it would be of real value if foreign - language journals were searched and if translated abstracts were easily available (of useful articles).

142

Our difficulty in subscribing to a data sorting system was outlined in the answer to question 11. The main objection is due to the ease with which we can get information from the university library and the cost of the SDI Service cannot be justified.

One difficulty with any data sorting system is the level of confidence it inspires in its users. The ideal system would miss no important (relevant) articles and could thus be relied upon to reduce to zero the work required in looking through lists of references of current periodicals. Unless a very high level of confidence can be ensured the SDI service has little advantage since the scanning of lists of references is still required.

A facility for looking up past references at the start of a new research project would be very useful. Even if this service provided a list of general references in the area of interest it would be useful.

Finally I should like to thank you for allowing me to participate in the SDI Investigation and I hope we have been of assistance to you.

148

I have found it useful and enjoyed seeing how you have built up this service.

I don't think 11(a) and (b) are quite mutually exclusive

1 I would have liked to subscribe

2 The service had a high academic value to me, but

3 the cost was nevertheless beyond my personal financial resources.

I think this will be the case with most university personnel. The nominal cost to which most of us would agree would probably be uneconomic from your point of view unless it resulted in a tremendous volume. In the absence of the service I shall return to searching the very adequate literature in the university which is probably inefficient (from the university's point of view) but no cost to me.

159

The service has been helpful, but not essential. For a member of staff in a University Department it is difficult to see how funds could be made available for this service on a personal basis.

161

My big problem is finding time for reading. I use your cards for two purposes:-

1 to find articles for immediate reading. There are, of course, far too many, so I read very few.

2 To build up an index, filed under subject, covering my general field. In the past I have done this job manually, based on my own reading - your cards speed it up and improve the cover greatly.

For both these applications, short summaries of the papers would help enormously. Titles are often too vague, and the keywords don't help all that much.

Recently I have had a lot of cards about nuclear radiation, its detection and its effect on transistors. It would be helpful to have negative choices available e.g. nothing "concerned with nuclear radiation", " by Dr. Whitfield"

or whatever. Perhaps you do this already.

165

Cost of £35 is definitely too high for large-scale use of service.

167

I was disappointed in the apparent inability to modify my profile so as to reject references containing certain topics, despite several requests to do so. Far too many irrelevant articles were picked up compared to relevant ones and relevant ones missed (the approximate ratio 1 2 x was 29%, 31% 40%). Also, many titles appeared in the current awareness publications quite some time before notification by SDI.

On the pro side the cards, size and layout, are quite satisfactory, and infinitely better than ordinary print-out.

For the future, I'm sure some selection service along the lines of the SDI must come, but it must be made more reliable, both for picking up relevant articles and rejecting irrelevant ones, but I'm sure that this is your aim also. Perhaps a simpler form of profile requirement might help, such as just a list of subject headings, including those which would make an otherwise relevant article irrelevant.

168

Too few journals were covered by the service. I found that most of the articles referred to by the SDI Service were in journals which I read anyway.

173

I was working in the field of non-linear optics at the commencement of the investigation but shifted the emphasis of my work into optical waveguides shortly afterwards. The service took some time to update my new interest and some confusion resulted, which was eventually cleared.

I found the service quite useful although a large proportion of the notifications were not directly relevant - but in that particular field there seemed to be comparatively few publications at the time in question which were of great significance.

However, the quality of the service during that time did improve confirming the usefulness of weekly returns and periodical article lists.

My interest in non-linear optics ended in September and I now work in the totally unrelated field of real-time computing. Though I have requested that my profile be updated this has not been done. I appreciate that the period at which I changed was near the end of your investigation period and this could explain the inability of the service to follow rapidly my change of interest.

175

Before asking university teachers to pay for the service you should have negotiated with bodies providing research contracts - MinTech, SRC etc. We are engated in frustrating correspondence and lobbying with these bodies about information service costs, and heaven knows when they will decide anything. Can you contact them? Universities will not consider paying until contractors decide, I hope you won't take me to court!

178

Would find service more helpful in assessing relevance of articles if an abstract was also printed on the card. I feel that the inclusion of US government R/D reports etc., is essential.

Conference proceedings should also be covered since in general these represent the most up-to-date research information.

179

I do not think that, given the available funds, I would continue with this service.

My need is very much in the chemical physics field (not chemistry) and you do not cover this area. However, as you see, I have enjoyed the SDI service.

180

The main fault seems to be the need for very careful statements of the profile. For example, some articles of interest concerned with stabilization have been missed because this work didn't appear in the title; the reverse fault occurs with far-infra-red materials, where I ofter get articles of little or no interest because it seems impossible to exclude them without missing some of interest. This fault is, of course, less serious. But I <u>have</u> found the service useful, nevertheless. Sorry about my slowness in completing the form.

181

The gradual improvement in the service, especially within the last six months or so, indicates that a much higher standard is a possibility. I wish you further successes in your work.

183

The only comment I wish to make, is, on your cards would you place the author's name at the top of the card. This would make it easier for filing.

185

Authors' addresses ought to be provided on cards to enable direct application for reprints to be made. The investigation and service provided to be much more useful in general than the Lowry-Cockroft abstracting system used hitherto.

187

It has been a pleasure to participate in the birth of this new information service and I have derived, I am sure, more benefit from it than I have given you in return.

One point is not clear regarding the group user service and how it could be charged. You may know that one of my colleagues, Dr. V.J. Phillips has also taken part in your trials though his profile is completely different from my own. Is it possible for our two profiles to be combined under the group scheme and thereby save us money? As the profiles are so different it would be easy for us to sort out the cards when they come, as this we would lose little time. If this procedure would be admissable then I think we would both reconsider our decision to opt out of the scheme.

192

I have the impression that the "recall rate" (less than 20 per cent category 1) in my case was due to my odd profile. I think you did well to achieve this.

194

Taken overall, from my point of view, the service has extremely useful.

My one adverse comment re section 2 is that my work changes rapidly, virtually from month to month. To change the profile at this rate would be unsatisfactory: it follows that items relevant to the current job were not always available at the time required. As an overall method of

keeping in touch with my subject then I am most satisfied, and SDI on this basis is an ideal intrument.

One further comment of a more general nature, even with SDI there is still a lot of literature and still considerable reading time has to be found.

195

Access to manufacturers' reports is important, e.g. Westinghouse RCA etc., have reports and are valuable as they show in what direction different manufacturers are proceeding with unclassified research. Also those published through the Office of Technical Services, US Department of Commerce, Washington DC, US Government Research Reports, and Technical Reports Newsletters etc.

Writing on the "relevance return" form about changes in requirements seems a very reasonable way of doing this. However, when I notified you about information on electromagnetic screening only a few articles were listed subsequently. Of course, this may well be due to the fact that only a few articles occur but no notifications seem to have been made of articles in the IEEE journal on "Electromagnetic Compatibility".

Also I seemed to get an increasing number of notifications on integrated circuits, both usage and fabrication, most of which I marked "X". I suppose it was due to my laziness that I didn't notify you about their non-relevance to my personal work (probably a paying customer would) but I think it would be to your advantage if your system could have detected an excess of "X"s on a particular topic and quizzed the customer if he wanted this topic deleted from his profile.

197

I have concluded with regret that, for myself, the service provided by INSPEC is superfluous.

This is possible due to the fact that my main present interest is in medical electronics. In this field the majority of information is presented in a relatively small group of journals and periodicals and it is practicable to maintain awareness by scanning the original source material - which had to be done anyway in order to provide your relevance returns.

In this somewhat compact field of interest, moreover, highly relevant articles are frequently written by workers who are known to oneself or associates in the field of interest. It is more satisfactory to scan the specialist periodicals and journals (including editorial material)

rather than a list of titles which frequently convey little.

I have appreciated your efforts and regret the need for the above criticisms. However, they concern the fundamentals rather than the implementation of your service. I have personally found more useful those systems which provide information retrieval with retrospective references on a specific topic.

199

I can suggest only one improvement - the modification of the cards so that a code is available for the user's retrieval of particular subjects from his own accummulated stack of cards.

201

In fairness to this investigation, my profile is hard to satisfy using published material in periodicals.

Research work like mine is pocketed and information scarce, but in the other subjects like lasers the information could be overwhelming and the service could tailor and select the relevant information.

202

In agreeing to participate in the investigation I recognised that my interests were somewhat marginal to the field covered by the experiment and did not expect much return. My expectation was in fact proved so I believe that my comments deserve rather low weighting in any overall assessment.

206

I have been very happy to co-operate in this investigation and am glad to have been of service. My own particular requirements have been well served except for the number of reports not notified because they were not covered by the service. Even if reports were included there would still be a gap because many reports of potential interest to me are classified under security regulations. I see no easy solution to this.

The service has resulted in my being able to make more effective use of the time I can spend scanning and reading, i.e. less scanning, more reading.

One aspect of changes in profile. It would be useful to be able to backtrack through the system to bring out previous articles which woul have been rejected under an earlier profile.

I shall not be subscribing because my own library service is setting up its own system but if I were back in an industrial or private capacity I would certainly favour the use of the service.

If I can be of further service at any time please feel free to ask.

208

Many of the references were very wide of the Information Requirements submitted in November 1967. Most were highly theoretical whilst I tried to indicate a more practical bias. Perhaps I should have asked for my profile to have been modified.

209

Our suggestion (for your obviously "scientific" clientele) is that you might indicate how profile can be altered - i.e. I feel that I want the search to be very wide but can probably suggest how to restrict it better than you can (with respect!). For instance, if I know something about the logic I could specify "Spectrometers, + Mass but not Spectrometers Radio Frequency" or similar combinations. It may be that one could use the selective system more effectively with more knowledge of its method.

212

If notifications can be kept to within 2 - 4 weeks of publication the service would be invaluable.

215

The results of the investigation have been useful particularly when allowance has been made for the specialist nature of my profile.

219

A lower cost would be essential if our own information services are not to try and provide a service of their own for wider use.

220

The service was treated as a separate exercise, ignoring our own Culham library service which is good but not so good in presenting information on cards and relevance. I am not justified economically in continuing the service on just this basis. I feel, although I know that my reference system will now be much inferior to my present card index obtained over the past two years, greater coverage would probably have weighed the balance in your favour.

226

The Culham laboratory (my employer) provides a similar service but I found the SDI Service better and more convenient. In general it required less time to sort through and was slightly quicker. However, these advantages do not justify continuing with the service on a cost-recovery basis, because I can get the same information (with slightly more effort and a little more delay) from the Culham Laboratory Service. Also the Culham Service includes major foreign-language periodicals.

242

The major snag is that it is often impossible for someone else to say whether a paper is of interest. As I mentioned previously words like "Breakdown" "Discharge" "Separator" "Spectrometer" are used in such a wide range of senses that irrelevant material is inevitably turned up. I would have thought that a computer service of this kind, once set up would cost less than £35 per head. Though I suppose this depends upon the number of participants.

I am glad to have been able to help you.

243

I think the SDI Service would be useful to those who do not have their own information service but I am very well provided for in this respect.

245

It would be very good if, for very relevant articles, you could supply a copy very quickly.

I hasten to add that this does not affect me too much as we have a good library information service plus access to AERE Harwell Library.

The accent is on relevant, the person requesting would not have to request willy-nilly.

In my case notification of relevant conference proceedings and reports would be very useful. However, here again the library do a good job on this.

The main problem as I see it is as follows: in my office is a stack of periodicals, trade journals, proceedings, reports etc. Two major problems stare you in the face:

1 To keep reasonably abreast of current developments

2 To obtain copies of very relevant articles pertaining to the project in hand and to pin-point them in the mass of material.

to keep up-to-date you have to struggle with an expanding field, so the information service must be more selective and precise. If the participant can feedback guidance on this then very relevant articles need not be missed.

One main advantage of the service for me - it keeps me up-to-date reasonably well without having to plough through several periodicals per week.

My local library are considering my request to stay with the service.

246

Many thanks for the information supplied which I have found applicable to my requirements.

As my organisation is Government controlled and has very good library facilities, i.e. Rutherford and AERE, it would be, I consider, an expensive information service considering the number of people who could use it. This is the main reason for my not wanting to continue with it. I have discussed this with our librarian and suggested the service could be centralized through them as most publications can. Generally my profile is electronics which offers a wide range of systems therefore could be circulated to a number of people within the establishment for economic considerations.

248

I think the accuracy of the profile will be considerably improved when authors are encouraged to compose titles from words taken from a standardised thesaurus.

249

In my own circumstances, supported by excellent library and information services, no real advantage can be claimed for SDI. Over the years an "entente" is formed which is invaluable.

Again, from my own point of view, I regard foreign material as essential. I can read fluently in French or German and wish I could handle Russian. In Fact I have just started to study Russian and hope to reach a level just high enough to translate titles or abstracts.

260

I cannot answer Question 5 without making an extensive search but, from memory, the majority, if not all, articles of special interest were notified by SDI.

As an experiment you provided a page printout in addition to the cards for a few weeks. I think I replied that I preferred the cards for my person use. However, I have had second thoughts about this and while I still prefer the cards for my own use I now think it would be useful to have a page printout in addition. This woul have the advantage that I would still have the cards for my own file but that I could circulate the page to members of my group to draw their attention to articles which I think they should see.

Because my field of work is on the edge of electronics much of my reading is now in journals which are not within the normal scope of Electronics (or even Physics). Also, quite a few of the relevant papers are in Foreign publications. Personally, I will revert to (or continue) scanning the current papers list, plus other more specialized abstract services.

However, a joint profile has been prepared, in association with F F Roberts and R B Wyott and in this way, I hope any items I miss, will be detected in this way.

263

I find scanning the relevant sections in CPP and CPE more satisfactory. I have found many articles of interest (many of them foreign) that have not appeared on my SDI list.

264

I feel that the service has met my requirements very well. I particularly like the cards as I can use these for requesting loan of items from the library and for recording comments on after having seen the article.

267

I don't yet feel I can rely on the service to the exclusion of other means of information retrieval. Consequently most of the articles I have already spotted before notification.

The cards are not sufficently uniform in size to form the basis of a card index. This is the most serious drawback of the scheme. The size should be standard

(do International standards exist, I wonder), and users should be provided with a supply of blank (or lined) cards, so that a card index can be formed.

For the same reason, the layout of information on the card is seriously at fault. I have previously given proposals on improvement, and so will not repeat them here.

A broad distinction in electronic engineering is between linear and non-linear circuits. I have no interests (at present) in non-linear circuits, and this was given on my profile. Yet I frequently received non-linear references.

Broadly, I feel that SDI is a brave attempt at an almost hopeless task.

269

I prefer the monthly CPE.

271

Subject and author searches in retrospect would be a useful facility.

272

In a three month sample period, I find I filed eight references per month of which three were SDI cards and five manuscript cards. The reasons why there were no SDI cards in place of the manuscript ones were:-

1 Foreign-language journal

2 Not electrical engineering

3 Internal report

4 Probably outside period of SDI search

Thus there seems to be no serious failure of the SDI system as at present organized. However, the advantage offered is marginal at present because:-

1 Useful SDI references tend to occur in only a few journals which can and usually are, quickly scanned anyway.

2 The need to obtain references outside the SDI field remains, and involves fairly considerable effort.

276

On glancing through a periodical which contains an article which has been selected by my profile, I occasionally see other articles which are equally relevant and have not been selected. An example that has first occurred is in IEEE Journal of Solid State Circuits for June 1969. I was notified of articles on pp 166, 122, 110, and 131, but do not seem to have been notified of the articles on pp107, and 145 which are also relevant.

(N.B. On looking through the cards I see that I do not have any in the 051... range - maybe a batch got lost).

Arising out of the above, it would be easier to check whether a given article has been selected if the card numbering have some relation to the periodical or the article, i.e. if all articles in a given periodical had consecutive numbers.

In the case above the article on p110 is numbered (052)079
p122 " 078
p131 " 122
p166 " 072

277

I have spoken to other users, some of whom have had trouble getting their profile to work. It would seem desirable that (a) keywords continue to be listed on notifications
(b) information of a general nature be given to new users as it becomes obvious (after a while) that certain keywords are always present in irrelevant notifications. (e.g. in my case I need synchronisation and not microwaves to reduce junk content). Such ideas occur to users who obtain information on (or guess) how the SDI system works. My profile is now hightly satisfactory.

The subject of Telecomms attracts authors writing in Swedish and Japanese, as well as English. Many of the Swedish papers appear as Manufacturers Journals (e.g. C H Ericcson) but the Japanese are more general. These later have often got English abstracts, which with the diagrams and equations of the original are highly instructive. These ought really to be included in you cover. Papers in German, though less frequent, are equally important. So, please, lets have foreign cover.

279

Service is too quick (or our library is too slow) - often several weeks delay in obtaining U.S. published articles.

282

Question 1
About 25 per cent of the references received during 1969 were considered to be not relevant. This was mainly due to difficulty in distinguishing between the purely scientific and practical applications of various papers on the ionosphere. The percentage of references which did not match my profile in any way was probably about 5 per cent.

Question 7
I think that my needs concerning foreign language papers are not at present by the available English translations.

Question 4
In future the SDI service will enable me to reduce the need to scan publications to help myself up-to-date.

284

I tend to want information on a specific topic on odd occasions. It would be usefule on these occasions to request a 'search' for papers on this subject, a fee being payable on a 'per search' basis.

286

MOst articles which were of particular interest were seen without use of SDI service. On few occasions when references were sought little new was found and in one case the reference to the information required, in an article quoted was very indirect.

I feel very stronly that to be of real use the notifications must include a synopsis. This was done one week in November 1969, card reference No. 962493 and was a great help. The very general title of articles makes it impossible to know what the article is about. An example is card 967019 "Distribution of the number of crossings". From the key words given it would seem to have something to do with frequency modulation detectors but from the title it might equally well apply to railways! There is no indication whether the article is an exhaustive study or simply general comments. Without this information much time could be spent obtaining article which subsequently proved of little interest because of the treatment given to the subject by the author.

289

A great deal of partially relevant information is coming

through at the moment. To some extent this depends on how strictly the offerings are judged. Most references have some relevance, and nearly all add to background interest, and some that are partially relevant now could be highly relevant in two years time.

I imagine this describes one of your basic problems and in the past I remember opting to risk receiving an excess of partially irrelevant references to be more certain not to miss the occasional highly relevant one which the computer may be in two minds about!

Despite a surfeit of 2's the service has been highly appreciated.

291

What about considering printing the Authors Abstract either instead of or as well as the keywords. This would help one sort out the fringe interest papers or the ones with titles not correctly advertising the contents.

In general some unwanted articles in the notifications are a small price to pay for complete certainty in finding things.

I am sure the success of the service is due to the continuous feedback of 1, 2, X, assessments and this should be kept up if possible.

293

Although I spent more time on reading I gained much more useful information and the time was more efficiently spent.

In question 7 I am not sure whether "learned journals" come under the heading of periodical, if "periodical" means less learned publications, such as trade journals, or popular review journals, such as "Scientific American", my answer would be '0'.

297

The service would be particularly valuable to people having little or no access to library facilities. Here at RAE, with an extensive library service, the main benefit of the SDI service is that one is saved the trouble of looking through indices for relevant articles of interest.

I think that where time is at a premium and where people are working at a distance from a library reading room the service would be very worthwhile.

Thank you for the information sent to me over the past two years.

302

I think you have been very successful, there is nothing I can think of adversely. The information I received showed early the nature of the service, I would have been completely unaware of most of the matter your notifications brought to my attention.

It should be stressed that a few seconds scanning your notifications brought to my attention matter that if I had obtained this from perusal of publications would have kept me so busy reading through the number of publications I would have had to see to find out the same number of references, I should have had little time left for work. In addition I have a card reference of tremendous value that I would not have compiled myself and this will continue to mean a vast saving in time in future when I want to see if something has been written or a matter I want information upon.

Widely used this service is of inestimable value nationally. Availability of information so easily has a second benefit that newer ideas and techniques are encouraged and much more likely to come about. Congratulations.

303

In my answer to 11 I should like to include that my local library/information service provides what I consider to be an adequate source of information. In consequence it would be very difficult to justify the cost of the service.

304

On the whole I have found the service satisfactory. I feel that my comments on too many irrelevant articles and profile control are as much my fault as the system, since I could have asked for my profile to be modified but did not find time to write to you about this.

308

The title of most articles does not convey enough information. An abstract is needed otherwise one still has to visit the library to obtain and scan the articles.

309

We at RAE are supplied with at least 2 selective info. services, one at Establishment the other at Departmental level including reports etc. not normally available to the public. These services are extremently efficient

(although probably very expensive to run). Any individual or organisation however, without this part of service, would benefit from SDI provided the percentage of relevant to irrelevant references increased.

312

I feel that the service was very good in general, the perturbations that occured when the profile was changed tended to frustrate, but when stable, the return was good. With a large library and excellent facilities within the establishment, it was felt that we could not continue the service.

315

The cost of the service is too high to convence management of the savings in time which might happen. Money and time are not alway obviously interchangeable.

I cannot suggest what price-figure would gain maximum response.

318

As I have stated previously that some titles tend to be misleading as to the subject matter of the article. Some time is spent looking up the article before one is able to assess its relevance. This is not your fault and I don't see how this problem can be overcome.

Although I prefer cards to computer printouts from the filing point of view, there is a personal problem of finding filing space. Since the service has been in operation, the cards collected represent a considerable volume and if one multiplies this by a yearly factor and bearing in mind the expansion of the service then the problem from my personal point of view would get worse. For this reason I would consider a fortnightly or ever a monthly service might help to ease the problem, or better still if my central library held the set of references only to which we all had access.

328

I think that the way to get most out of the SDI service is to adjust the scope of one's profile so as to cover say 90-95% of very relevant articles. If the profile is too narrow, clearly a large number of articles would be missed, and if too wide the selective part of the service is lost. Therefore, the use of the service depends on how careful you are in specifying your profile. In all information searches there are always

articles on the fringe on one's profile which could be very relevant. I do not consider it the job of an SDI service to cover these.

As a means of obtaining a hardy list of references the service works admirably.

One great virtue I have found is that receiving these cards early enables one to get to the head of the queue of people waiting to obtain the article from our establishment library.

I feel the investigation has been carried out in a very well organized and useful manner.

332

My general comments are necessarily influenced by the good service provided by the RRE library. SDI notifications has sometimes been quick, though this is not usually of significance.

I have picked up a few articles which otherwise would have been missed - say 5% at most of known relevant articles. The time involved in taking part in the investigation has been of negligible significance.

333

As a designer of electronics circuits it was difficult to write a suitable profile, and I find there is no substitute for scanning British and American Magazines and manufacturers' literature. Often, items of interest are found in the most unlikely articles.

The profile was deliberately made broad, but this meant that a lot of irrelevant information was received. What might have been more useful would to have been able to have asked, once only for all information in the past (say) six months on one particular subject (e.g. applications of MOS digital integrated circuits, or the use of FETs in radio frequency amplifier circuits.)

334

Thank you for this service. I understand from our library that a group subscription may be organised for the division at RRE (Division L1) in which I work. I shall be leaving RRE in August 1071 to set up as a private Consultant, and I shall probably then wish to join your SDI scheme on an individual basis.

338

I think it would be beneficial to have a better system of producing a profile. One of the keys to the relevance of information received is the profile. If this is too wide and not specific one receives a lot of irrelevant information.

I would suggest that a profile form be produced in question format. At least it should be pointed out that a profile should be specific.

342

In my particular case, although lists are generally relevant to my requests, my true requirements covered a wide range of subjects which do not usually appear in periodicals, furthermore, it would not have been possible to specify at the beginning of, say, a year what subject I was reading to cover.

343

Question8
Initially I found my profile was biased too much towards physics of thin films. I mentioned this as a criticism at avery early stage, but it was only after many months of misses and near misses that the profile appeared to be rejecting this type of article.

Question 10
Value of service to me has particularly been in speedy notifications of relevant articles. This has meant I have been near the top of any waiting list to view articles.

The service has been a useful "back-up" to the local library lists and abstracts. The SDI service appeared to scan a wider range of periodicals than do the local library lists.

345

Most of the articles which were missed seem to have come from specialist computer magazines in particular the BCS publications.

349

I do not know whether we are unusual in having (a) a good library, with easy access to other libraries, (b) a group who manage to keep an eye on the literature, but for my part the SDI service, although excellent on the whole, was not particularly useful, in that I had almost invariably seen the relevant papers, by the time SDI notifications arrived, or noted them for future reference.

I think there were about three interesting looking papers which I had not seen and which were readily obtained by the library; only two of these were in fact relevant. Two were in journals we do not receive.

I did mention several times that I was not interested in plasma physics, etc., at the beginning; my interests are a) R.F (in the field) measurements
b) Instrumentations of large antennas.
Nevertheless I received a large number of papers which fell into neither category, no doubt through an accident of coding. (For example although I am interested in using semiconductor devices, once they are a reliable going concern, I am not interested in papers on obscure effects, or how they depart from expected physical mechanisms, and, (since we do no development work) in knowing how to measure these peculiarities, I am not interested in plasmas, propagation in them ar aerial impedances in them) however, this may be unavoidable and is not a great inconvenience, merely a waste of paper etc.!!! (They just went straight into the W.P.B.)

352

It seems to me that in my particular field the headings under which the articles are assessed for relevance are rather too broad to give a very good service. (Obviously the number of fields into which articles can be subdivided is limited, and this I imagine is one of your problems). On the assessment of profiles generally, I wonder if it would be worth allowing users to see a list of headings (the ones listed on the cards, e.g. Ionosphere, Radio waves, Frequency LF, etc.) and help to form their own profile from this sort of infomation. It would involve more work on the user's part, of course, but cuts out one stage in profile assessment.

I'm sorry not to be continuing with SDI Service, as I think it is a very worthwhile exercise, but unfortunately my employer will not support it financially and I am not sufficently affluent to do so personally.

Thank you for your service over the last two years.

358

My comments have been influenced by the fact that I am working in a field where research is long term and where rapid changes in outlook, theory or experiment do not usually occur. So a very rapid service is not essential. I also have easy access to a good library and information service and much information is obtained by contact with other workers.

It is preferable to me to have too many items, including irrelevant ones, than to miss potentially relevant items. Many items can be relevant too, as background information rather than being directly of great value.

The main problem in using the service is to know whether to rely entirely on it and really reduce scanning time or to mistrust it and scan anyway. Howedver, I have found the service useful as yet another method of coping with publications and the time spent scanning the cards themselves is very small.

I shall probably be joining a group subscribing to the service (when we can agree on a suitable profile).

359

Over the period of the survey I find that my profile has gradually changed and that new aspects of my work need searching back over a number of years to find the relevant information, thus SDI cannot cope with this aspect.

I find in general that since reports were not covered, I have seen much of the important information long before it is published in journals.

Much of the more important new papers such as in Applied Optics, Rev Sci Instrum etc. I see at about the same time as the cards arrive.

360

The main limitation to the value of the service is the fear that some relevant articles will be missed, even if this few can be shown to be unjustified. If no articles are missed there is no need to scan the literature; otherwise the whole scanning exercise must be carried out and the service has achieved little.

On the other hand the service is very useful when one just doesn't have the time to go to the library for a while because

a) it is highly likely to give reasonable early warning of the most relevant articles and
b) it jogs one's memory that the time for a library visit is nigh

Although a limitation to the present scheme and not so convenient for card indexing systems, the cost of the scheme might reasonably be reduced by asking each user to name say six journals that he would regularly scan and receive no notifications thereto. (90 percent of my notifications have been from six journals.)

Many thanks for the service you have provided, I have found it most useful.

361

Two main limitations were:-
a) no foreign language journals
b) coverage did not extend to journals (such as J applied Meteorology) in which papers relevant to radio problems now appear.

362

The main problem is that no computer can pick out papers which appear to be "way out" but which may trigger a train of useful thought. Thus I feel I will often need to scan the main journals.

One aspect which I have found useful is the availability of filing cards. Even if I did my own scanning entirely these cards would save a lot of time as I previously produced cards myself for a filing system.

363

The service has saved me little time because, in its experimental stage I was not prepared to trust it not to miss any article of importance. It has proved to be very reliable and I would now be prepared to rely on it with some confidence.

367

I have found your staff most helpful and efficient as individuals, but somewhat impersonal as an organisation. This may be unavoidable.

368

The service increased the flow of information to myself and my staff. It also increases our work load to the extent that I have almost cancelled it, however, it is valuable.

369

Towards the end of the investigation I changed my employment from a inistry of Technology research establishment to a university. However, in both cases I was responsible for the management of a computer service. Thus I had a general interest in all articles on computer techniques both hardware and software: when such articles were notified to me I graded them as 2. At different periods in

the investigation I had specific major interests depending on what projects were being initiated on the computer. Articles on such subjects I graded at 1. Unfortunately if I received further notifications on such subjects the project concerned might be underway (i.e. the programs written) thus the grading might revert to 2. This I would presume led a rather unstable profile in my case.

I would like to thank you for the opportunity to take part in this investigation.

377

Despite the fact that my replies contain some criticisims, I recognise that my profile would be very difficult to define accurately, owing to the very wide spread of interests covered, and the fact that I am not engaged in purely 'research' work.

379

On the whole I am very glad to have this service which imposes very little effort in exchange for a regular input of information. I do not expect it entirely to replace a regular browse through the library but it reduces any anxiety of missing important articles if I do not find time for this.

380

My requirements for the coming year will be covered by the subscription of another person within the same group with very similar interests.

381

I can only say it has been of great use and I am continuing with the service, many thanks.

382

From the type of article notified, I wonder if the profile has any negation component? For example could one have a profile check:-

Article content	Requirement
Oscillators	
Microwaves	
Semiconductor Devices	
Thyristors	

This article would not be wanted because it treated the

Thyristor control of microwave circuits and was a low frequency subject, and so not wanted. This may not be an ideal example but on a number of occasions some negation would danger of missing something useful by this technique, so it may be used only continuously perhaps.

383

I understand that selection was based on a match between profile and a set of keywords abstracted from the article. Some of those which turn up frequently are ambiguous (e.g. "correlation") and others convey zero information (e.g. "noise") since they will appear in virtually all articles in say the communications field. I feel that titles form a better basis, and my judgement of relevance was, perforce, mainly based on titles rather than reading the articles.

I prefer our local system of circulating copies of contents lists of periodicals, since I know which journals to go for and can scan a page much quicker than umpteen cards. Any article missed will if it is a good one, be cited somewhere else soon enough for my purposes.

Quite honestly, I do not think it will ever be possible to automate human communications successfully.

384

The service has been very useful, and has brought articles to light which might otherwise have been missed.

I think it would be useful if the profile could be modified frequently (i.e. every month or two perhaps) to look for specific articles besides those on the main profile. This is envisaged as a sub profile which could be tacked on to the main profile.

This might help those who are engaged in a wide field of research but require specific information at a given time. Have other users similar views?

385

The only serious omission in the classification seems to be the division of networks and circuits onto classes, in terms of the frequency range in which they are intended to operate. I have regularly received a batch of references in which 30% refer to work in the microwave field, which is of no interest currently. Possible this could be overcome by modifying my profile, but I deduce from the "key words" on the bottoms of the abstract cards that it may not be easy to subdivide by frequency of operation.

386

On the whole the framework must be too rigid for the development areas in which I work. Interest areas often change rapidly and on the edge of government work are rarely if ever reported in commercial journals. I seemed to gain more from our library information service than from SDI even in areas I would have expected my profile to cover.

389

Many firms, universities etc. have card sorting machines these days. At a small additional charge, I am sure that the cards could be used for information retrieval as well as dissemination, and the usefulness of the service would
a) greatly increase
b) be better than that of rival organisations e.g. Lowry-Cockroft Cards

397

I have found the SDI service generally satisfactory and the main complaint being the number of irrelevant references - especially in the early days - this considerably improved by the end of the operation.

The usefulness of the service to me deteriorated due to a change in circumstances which had nothing to do with the SDI scheme, but as occasioned by the well stocked library. Thank you for letting me enjoy the SDI service for such a long period and I hope I have been as much help to you as the service has been to me.

398

The profiles would be better in my view if they were more selective. Of course, initially one did not know how the scheme would work out but the user could, if starting again, make his profile more selective by reducing the field of interest somewhat to his speciality. He would then rely on the occasional assessments of articles more heavily to catch the (inevitablygreater) number of mined articles.

399

I have found the service exceptionally useful and it has certainly solved the problem of current awareness. There remain two problem areas which might be incorporated into the service eventually.

1 Searches of published literature. My field cuts across many established disciplines, so I often have to look into papers on some well-established subjects. This would also help people starting work in any field.

2 Papers can not be read thoroughly quickly so unless

the librarian is very tolerant one must acquire a Xerox copy or a reprint.

This, of course, ignores the biggest problem of all - finding time to read all the papers of interest. Thank you for making it a little easier.

403

I get the feeling that, had my job interests remained largely unchanged during the investigations, the items would have been on average more relevant still. I think that my relevance indications are partly coloured by my personal interests, as well as the interests demanded by my professional interests, which in fact changed in the two years of SDI quite significantly and more than I would have suspected two or three years ago. I think this changing pattern of interest has probably confused the determination of my particular profile. I suppose this type of change is inevitable and quite common, so presumably the only remedy is super-rapid response of profile shaping to changing relevance indications, i.e. week rather than half a year. This is not to say that I think it takes half a year for a profile to respond, I do not really know how long it takes.

404

This would be a useful service for me to have as a supplement to existing library services, especially as our firm provides no abstracting service such as was provided under former management (no doubt on cost saving grounds).

Over the past year I have done no work in accordance with my profile, having been transferred to a team re-equipping Goonhilly I Aerial, and it is only in the last couple of weeks that I have got back to pulse work for which my profile was formed.

I cannot imagine any design engineer in my company spending even a penny of his own money on your service as salaries in real terms are going down, not up.

I think your service would be extremely valuable to research people with a narrow profile and wish you luck in convincing those who hold the purse strings that this is so.

405

I find it not possible to answer Section 11 as set out. My reasons for not supporting the service now are two fold:

1 the very highly specialised field I am working in is not yet covered by many publications and calls on a very limited area of the microwave measurement field.

2 I consider that the onus of paying must rest with the employer in general and he is unlikely to support an individual unless his particular field is widely publicised and SDI could therefore, save much search time or lead to rapid updating in a fast moving scene.

410

I am slightly unhappy about the way in which the original profile was formed. Since the efficiency of the whole system seems to depend critically on getting the profile right, perhaps we should have been more careful about its initial compilation.

It is not always clear to the user that the profile generates the "net" in which relevant articles are to be caught, and that failure to be sufficiently specific in its generation can cause a rather side mesh to result, producing lost articles. For example, my profile did not specifically mention "radio wave propagation" I had though this would have been covered by other more general key words - and as a result I have missed a number of relevant articles.

Are you sure that the instructions sent with the blank profile are sufficiently clear on this point? Surely the more detailed the profile, the better for you and us?.

412

As far as I can recollect I received no information on Conferences, Books, Patents, Manufacture's lists, standards and specifications, Theses and dissertations, Reports, in English, let alone foreign languages. I have marked these items as in question 7. A lot of very useful information comes out of conferences. It would also be very useful if it were possible to carry your literature search to earlier years. Particularly in patents which frequently contain information not available in periodicals from conferences.

416

Apart from a subscribers normal service in the subject of his profile, it sometimes becomes necessary to investigate a problem quite outside his normal line of research. Are facilities available, or could they be made available, for an individual extraction of articles on any particular subject?

418

The service has enabled me to make far more efficient use of the limited time I have available for information gathering and as such it has been extremely valuable.

424

On the whole a satisfactory service was provided, and I should like to thank you for this.

425

Now that the SDI Service is on a cost-recovery basis there is a need to make a more business-like approach in defining what the service can do. I should welcome a report on the inner workings of the system, written for the benefit of the user: eg it would be helpful to know if one can interact effectively by using key words to encourage or discourage certain types of reference.

426

The addition of some "higher-level" Key-words (such as "broad relevant", "general principle" (i.e. application to other fields), "authority" etc.) though admittedly difficult to us in indexing might pay high dividends by filling in gaps which a more "mechanical" program might leave. This would tend to minimise the difference between a computerised service and a direct person to person one.

430

I would like to thank your for the service provided during the last two years and hope for your success in the future.

435

I think that a worthwhile service has been provided, especially in view of the ever accelerating volume of publicised articles, and I hope to benefit from it in the future.

I am a little worried about the apparently high cost (£45) for the yearly service, although I can understand that the cost of the computer services must be high.

437

During the past year 50 or so periodical articles were of value, but at the very best these can only point one in the right direction. Most of my problems have been of a development nature and therefore the only <u>real</u> solution is to "suck it and see".

I have a feeling that this type of excellent services will be of great use to those in pure research, but limited to those lesser mortals, like myself in industrial research establishments.

442

I think I should have put more effort into making my profile exclude circuitry articles, but I didn't seem to have enough time.

455

5(a) The answer to this depends on how much wight you attach to the word "particularly". The number given (i.e. 16) were or would have been classed as "1" in your 1, 2 X system.

460

It is my view that the service has not been of value owing to the transient nature of my own interests. The majority of my information problems have been concerned with literature searching new fields which will remain of importance tome for a limited period rather than keeping up-to-date ona smaller number of topics which are of sustained interest. Had my interests been more specialised and long term I am sure the service could have been of greater value.

Thank you for allowing me to participate in this exercise. I would welcome an opportunity to see an analysis of the results.

461

The present system would seem to be satisfactory for people working on particular subjects for some time.

462

I have retained the cards giving references in three groups corresponding to the 1, 2 and X relevances. Observing the piles now confirms that there are very few cards very relevant to my main interest. In retrospect my memory tells me that initially the service was poor. It began to improve and sent more relevant references to that main subject only after I had notified you of a change required in my profile due to a change of occupation at work. I then continued to receive many good references to a subject which had been my prime interest, but which was now only of secondary interest. Only in the last month or two has it appeared that the penny has

dropped into the computer programme that I have changed my interest. I have received a few references on my main subject of interest as mentioned only for about the last eight weeks whilst my change of interest took place over a year ago. Now I am changing my interest again so that the service would be out of date again.

464

In general the service is useful but we have a strong pressure to read all useful papers and these usually appear in journals in the company library so I only save the trouble of making out my own file cards for useful papers.

468

It must be obvious that I am one of the probably very few who slipped entirely through your net. I have thought a great deal about this without being able to offer any really satisfactory solution. I work on a wide range of microwave devices but my interests are almost entirely technological. Perhaps the types of periodical are too "academic" or "fundamental". Perhaps the type of article I need lacks appropriate coding words in the title. It does seem from remarks of colleagues and my own items that you cater very much more for the research/development man than the practising engineer.

Nevertheless, good luck and thanks for trying.

469

I think my main comment has already been made and indicated in the answer to the last question, viz.: I would have been happier if during the course of the SDI investigation one's profile had been modified by means of feedback to ensure that a higher proportion of relevant articles had been received.

470

Q.1. A higher rating could have been applied if the service had been more regular and prompt.

Q.2. Difficult to answer. We have certainly found many relevant articles about which we were not notified. You may, however, not have scanned these particular journals.

Q.3&4 Mainly due to incomplete literature coverage by yourselves and delay in receiving returns.

Q.8. Relevance returns should only be made if the user

is not satisfied with the yield.

Q.10 A fortnightly service would be acceptable if it covered articles published in the previous 2-3 weeks.

471

The service was found to be useful but not essential; the omission of manufacturer's literature and advertisements meant that I had to pursue many of the relevant publications anyway.

As my field of interest is narrow this is easily possible.

I consider that the cost of continuing the service is high and for my present duties it is not justified by the time saved.

I believe the service missed an article of mine published in Mullard Technical Communications May 1969 Vol. 10 No. 99 entitled "Four phase Logic Circuits using MOS Transistors".

473

It is too expensive for a private individual. Annual subscriptions would probably have to be made by one's firm.

481

In creating a profile, it would have helped if a list of "standard" keywords were used. I think that the articles I missed were due mainly to ambiguities in these, although these might have eventually been reduced by extending the profile.

482

In the field of systems engineering, review articles are often the most useful ones in producing new ideas or ways of tackling a problem. In this field, magazines like Aviation Week are very good, yet do not seem to be covered by SDI.

I still do not feel that my profile is quite right, although I have not done anything very positive to help apart from returning the relevance assessments.

490

The immediate access to relevant data has proved valuable.

In extending this system to my requirements of a permanent record of information sources, it would be useful if I could file the cards using the keywords of my profile. This is difficult at present as I have to photocopy cards with more than one of my keywords in order that a simple system could be complete without cross references. The provision of additional copies of cards where more than one keyword occurs would be useful.

501

I think it is wrong to assume that casual reading is necessarily unproductive. I tend to spend sometime each week doing so as a form of relaxation.

505

The unforeseen value of the service has been the occasional article on the 'edge' of the profile which was in fact of unrecognised relevance. The debit side is the number of articles which were scanned, when copies were obtained, and were not of interest. The latter article is many cases could not be judged by their titles. However, overall, there is no doubt that some very interesting articles did come to light which might otherwise have been missed - hence the increase in reading time.

508

As per my previous letters.

516

For someone with the wide diversity of interests such as myself I fear that by scanning Current Papers I pick up a lot of articles that are not notified by SDI. I am not clear whether this is because a) all articles in current papers may not be scanned by SDI, or b) my profile is far from idea or c) the keywording is inadequate. Whilst SDI is useful as an additional source, it is a long way from being a satisfactory alternative to Current Papers - and I still consider it will be essential to scan them for a long time to come.

Whilst not wishing to belittle the SDI experiment and fully appreciating that it is only intended at the moment as a current awareness system I feel that the usefulness of computer sorting of information may have greater value in the field of information retrieval. Several times in the last year I have had people taking up the study of new research topics and the time spent

in searching past literature/abstracts etc. has been substantial. In such circumstances a selective retrospective retrieval service would have been invaluable. I hopewe may have one one day.

517

I feel that the problem of defining clearly the area of our activities is a basic one. We are looking at a range of characteristics of carrier injecting structures in semiconductors and a list of possible key words would be excessive. For instance we cannot completely exclude any semiconductor even though GaAs and II-VI's are our chief concern. We cannot completely exclude such words as contacts, injection, MOS, MIS, electro-luminescence, juctions, capacitance, I-V, photo effects, surface, interfaces, barriers, Schottky barriers, and a good many others although we certainly do not want all available information on all of these.

Ultimately the practice of scanning journal articles titles by eye - checking immediately on key words by reference to the abstract and the text is in the circumstances the only fool-proof method.

I think your service is probably excellent for a well defined topic e.g. magnetic materials - superconductivity etc.

I would be interested to know if you can see any possibility of modification to your system which would permit any more subtle selection criteria to operate.

518

I have found this service an extremely valuable aid to my work. However, the simultaneous improvement that has been made in the 'Current papers' and 'Current Abstracts' has made the use of a personally tailored service less essential. The classification scheme adopted is sufficiently precise to enable a review to be made each month of the relevant literature. It also allows for a certain percentage of random browsing, and although this may be considered inefficient, it performs the function of introducing random mutations into ones knowledge, thus allowing a process of evolution.

A feature that would be most valuable would be the possibility of literature searches. Hopefully this will be possible as you increase your data base. I would say that efficient searches would be worth some tens of pounds per search on average, and this problem is often of greater

importance than that of updating current information.

In conclusion I would like to say how much I feel privileged to have been associated with your project, and wish you success in extending your work in the future.

520

I feel that any shortcomings in my notifications are largely due to my lack of time to take positive steps to react. I hope to give this matter more attention in the future.

Please accept my thanks and appreciation for your very co-operative and helpful activity.

521

I find the SDI service extremely useful. The main problem I have is that frequently there is a considerable delay between receiving the SDI cards, and the appropriate journal being received by our library, for American journals. I have no complaints about the SDI service itself.

523

It seemed to me that I received far too many irrelevant articles of little interest - which I feel was due to the fact that the profile did not enable me to narrow down the field sufficiently for my interests. The field of Gas discharges is very wide and the number of words available for the profile was toc limited. I also find that many of the articles of interest to me, are in journals such as Electronics, written by editors etc. and none of these are picked up by SDI.

528

To date the service has provided the most comprehensive and clear cut method of obtaining references that I have personally encountered.

Thank you for the original offer to participate.

531

I think the service made a very good job of interpreting the profile which I wrote. With a wide ranging profile there must be many notifications of minor interest but I accept this as inevitable.

Do you store the information in a form such that notifi-

cations on a particular subject which have been issued over the past 1 or 2 years can be supplied on demand? I think this could be a very useful service to those embarking on a new field.

Several articles of interest to us are in journals such as J. Chemical Physics which are not covered by your service.

532

It appears that my profile has failed to pick out some important articles - others have not been notified as they appeared in periodicals not covered by your scheme. For example, I have no record of being notified of three mass spectrometry papers in 'Vacuum' vol. 19, no. 7 by McCracken, Ball and Wilson resp.

I have recently been using 'Mass Spectrometry Bulletin' published by AWRE, Aldermaston. Although most of its references are of no relevance, I have found those which are to be more comprehensive than those notified by the SDI service.

Incidentally, I did ask for dielectric aerials to be included in my profile, although it was not now of relevance in my work. Several articles on this subject have appeared in 'ElectronicsLetters' and none have been notified.

535

(1) There is a fair proportion of reference, which are entirely irrelevant to my profile. Some of these are due to the rather open ended nature of the profile in certain areas but some are inexplicable to me. In the example I enclose I cannot see the relevance of many of the key words to my profile. Speaking more generally it is a basic weakness of the system that the same quite long list of keywords can still pick out 2 activities which in practice are virtually unrelated. This weakness is sometimes rather apparent.

(2) Despite (1) above I am quite happy with a system which throws up many irrelevant items - it doesn't take me long to dispose of them! It is much more serious if relevant articles are missed, In this connection I would welcome a much more complete coverage of a) conference proceedings and b) Government reports (particularly U.S.A.). Perhaps you could pay more attention to discovering what conferences are being held and making sure that all proceedings are included in your system.

536

Beside the possibility of sending information by direct access to a graphic display terminal, a facility most large organisations will shortly acquire, it would be beneficial to be able to call up references in other fields, not connected to those in the profile, without modifying the existing profile. This would only be of occassional use, but might stimulate cross-fertilisation of ideas.

This information would only be required occasionally, but could determine whether the system was competitive.

537

A very large number of category (2) cards were received in relation to (1) and (X). This may have been partly due to difficulties in defining my profile. I feel it would have helped if subjects had been classified according to, say, the Universal Decimal Classification for the purpose of the investigation.

I should like to thank you for all the helpful information you have sent me during the past year.

542

I found the service most successful when applied to specific topics e.g. I.F. amplifiers or Phase Discriminators. My profile, which was based on my systems interests, was really too generalized to be of great value; however, I only discovered this after about six months or so. Another problem is that ones interests change with time and this might require radical alterations to the profile.

544

A generally useful service, but it overlaps a similar service from our works library.

545

The service seems to have achieved its objectives, however in my case it would be fairly safe to limit the search to about three periodicals for highly relevant material and

perhaps 20 more for less relevant background topics.

547

The SDI service is potentially very useful. However, we have an excellent library abstract service on site which gives a much larger selection than does your service. Special articles can easily be obtained from Barnard Castle.

549

This service is quite essential in my view where local (works etc.) library services are inadequate, therefore, in my view the costs of services even at £35 were not too much but in my own case your service was not so essential as our library service is very comprehensive indeed.

Thank you very much for the efforts you and your staff had put in this investigation for the benefit of industry as a whole.

551

A broad profile may result in a relatively high proportion of irrelevant items. I believe that the SDI service will be more useful when profiles are narrow and well defined. For more varied requirements reference should be made to a summary of abstracts before articles are selected.

552

The selection of short abstracts of articles, instead of the selection of the titles of such articles, would considerably increase the value of the service.

559

We have a very good and speedy library service. They produce a very good weekly abstract on library additions thus short-circuiting your service on received journals. Hence our requirement is for journals, such as foreign publications not taken, to be dealt with by your. Thus as far as I am concerned you have been scanning all the wrong, i.e. popular, journals!

If you scan more obscure journals then it could be of use but will eliminate completely the need for things like Current Papers.

I have therefore, recommended that our library subscribe on a Group basis but with their intake of journals inhibited. This should eleiminate 90% of possible cards and provide us with usually obscure information.

562

Generally the local library provides a good service covering the journals available in the library. A few journals not covered have had useful papers in them which were picked up by SDI. Usefulness is limited (see opposite) because of security classification requiring special communication publications in some fields in which I am interested.

Also about half my activity is concerned with forward projects and new applications, where the subjects are broad and fast changing but probably not having, for various reasons, much current publication. Consequently I have not updated my profile to attempt to cover these. However, on the topics requiring my more sustained activity I had come to fall back on SDI as bringing articles to my notice in conjunction with our local library service, rather than spending time scanning.

564

I am a development engineer in a commercial firm. I find that for, say, 1 month in a year I am actually 'designing'. For the other months I am testing, engineering, dealing with factories, with faults and comments from users etc.

During the 1 'design' month I want access to information on many different aspects of the job. In this I find the local library index, Science Abstracts and my own private notes very useful. Also manufacturers' publications are invaluable.

For the rest of the time I don't want to be bothered with reading. If I see a good relevant articles, all I do is to make a note of it. The time for incorporating any good ideas is past once the design stage is over.

As a suggestion, it might be useful, if for a fee, one could ask for (say) 'List of all articles published during the past 2 years on voltage-controlled attenuators for frequencies from 3 - 2- MHz.' But would this be any quicker or more thorough than looking through Science Abstracts? I doubt it.

565

I found the service a useful adjunct to our internal library services which picked out a small number of items I would otherwise have missed.

My personal feeling is that though the service could be

improved and select all articles of direct relevance one would still have to scan a large volume of literature in order to pick up useful ideas, techniques and approaches used in other fields. For instance a technique for cancelling hum pick up in a bio-medical instrument could be used in a TV camera. A computer will never pick out this sort of thing from scanning an eight or ten key word summary.

566

I think the main value of this investigation is that a large number of journals are systematically searched. If one searches oneself it is time consuming and it is very easy to miss particular issues.

571

I find that I need more time to myself in order to study the papers and books upon which I lay hands rather than yet more articles from an ever increasing number of sources.

In industry one must give the impression that one is actively working upon the job in hand! Sitting and reading gives the impression to managers that one is slacking or too tired to work! Therefore, I read mainly at home. At home, I find that in order to "make ends meet" I am obliged to spend many hours in decorating, digging the garden, mending the car, mending the telly, etc. If I had sufficient salary to pay for this work to be done, I would gladly spend the time thus gained upon more reading and thus making myself more efficient at my work. Judging by the 1.5 million people (mainly skilled workers and their families) who have left this country during the past 5 years I guess that many people feel the same as I do.

After giving considerable thought to these problems I believe that the only way to have a satisfactory career in engineering under conditions obtaining in this country is to stay single throughout. (Age 47).

The number of irrelevant articles notified reveals a weakness in the method of profile definition. This may well be the fault of the participant, e.g. a far too general interest profile is given initially for fear of limiting the suefulness of the service.

It would help if it could be suggested that it may be in the interest of the participant to limit his field of interest for the initial profile.

578

My present information requirement is for articles covering the subject of F.D.M. Carrier Telephony in fairly general terms. As I don't need to pursue every related subject in considerable detail I feel I am unable to make the best possible use of the SDI Service.

583

I thought the relevance of the material improved as the exercise continued.

584

I am perhaps not a typical example of the type of worker who would need the SDI service. I make it my business to at least scan the contents lists of most of the "standard" English, American and Russian publications, and am assisted in this by the exceptional facilities available to Marconi G. Baddow Library. For my own needs, I shall prefer SDI to provide more information: a) from the more obsecure foreign journals e.g. Czech, Hungarian, Chinese. b) from the theses published by European, American and Russion Universities. I have great difficulty in finding out what is available in these areas.

585

The class of user who definately derives most benefit from INSPEC SDI is the research student, and personnel engaged in base level investigations as opposed to senior management personnel.

Whilst executive personnel could offord the service those at lower level certainly could not. I was extremely surprised when I discovered the cost of retaining SDI membership - completely out of all proportion to the value it gives me.

587

The one comment I would make is obviously a product of my special circumstances (in that no funds were available to me and in that my particular requirements are found in but a few journals); but the comment may be relevant if others are in a similar position "in number".

The vast majority of the articles I have found useful and interesting occurs, roughly evenly distributed, in about 14 journals; all but 3 of these are taken by our

library here. The cost of the present SDI service per annum would probably cover the cost of subscription to these 3 journals. The information I would not come across IMMEDIATELY if I then merely used these 14 journals alone would be, at an estimate, 5% of my total. Although (judging by the accuracy of your service) I would not miss the 5% by subscribing to SDI, the extra convenience of having the extra 3 journals would, I think, be a worthwhile trade for it .

589

As mentioned above I am at present in a situation where I am unable to study the literature to the extent that I would normally. For the purposes of the SDI investigation, therefore, I have interpreted "relevant" in the sense of relevant to the field in which I would like to be working if I were able to choose.

The proportion of highly relevant references was greatest right at the start, and has shown a gradual decline. At the same time, the number of non-relevant references which was small at first, have gradually increased, reaching a peak at about two thirds of the way through the investigation. The number of partially relevant refs has increased noticeably, and this represents some degree of success.

It looks as if the method of feedback has not worked as well as it might have done. It could be, though, that these trends are not significant because the sample is not big enough. You will no doubt lump them all together for analysis and come up with a more confident answer.

704

Although SDI has been shown capable of meeting our specific needs I feel that the individual research worker still benefits from scanning the contents of journals regularly in order to see what is going on outside his speciality. If SDI (or a similar scheme) was the only information service we would become extremely narrow in outlook. The main value of SDI has therefore been to back up the ordinary library service rather than to replace it.

705

I support SDI wholeheartedly in principle and look forward to refinements as proposed under (2).

712

(1) Under item 5 the discrepency between the numbers is due we feel to our profile, which we did not change too drastically because we were interested in testing the system as it stood. Also the number of "highly relevant" returns which we made would not, of course, represent the number of papers which actually helped us with our research.

(2) The answer to 3a is due to the greater attention now paid to information retrieval.

(3) We have been very interested to take part in this survey.

713

As indicated over leaf I feel that insufficient guidance was given on the basis for the SDI and profile definition. This may be an unwarranted criticism. However, we now are in the process of updating our profile which should result in a better service.

714

One has still to remember to look at the cards and they should also be filed in same order. Both time consuming and not thought worthy of the effort.

715

The main difficulty is reading the articles uncovered which is hardly your problem.

716

With the co-operation that is supposed to exist between the IEE and the IEEE we ought to be able to reduce the delays in obtaining IEEE publications.

The most up-to-date work is often presented at conferences, then later published after a long delay. It would be useful to know of work presented at conferences, without waiting for the conference publication to appear.

725

Like most R & D personnel, the writer has for many years kept a personal reference system, by subject headings e.g. Amplifiers, audio, Pulse circuits, Modulation and demodulation etc. This uses standard index cards. It would have been helpful if the SDI cards were of the same size, to enable integration into this system.

726

My circumstances are probably peculiar in that I have moved away from the particular field of interest - 'electronics' - during the period of the investigation. I have retained an academic interest in the topics represented by my profile whilst in practice I have had no chance to follow any of the work in the scientic literature. As a result my reading and follow up of the SDI performance has been zero. I marked SDI notifications as relevant or otherwise in the spirit of the profile and many papers of potential interest have indeed been notified to me. However, it is apparent that I have not fully co-operated and cannot give meaningful replies to many of the preceding questions.

In my present occupation I generally need information which is not new and is outside the scope of the investigation. There is therefore, no point in subscribing to the continued service in the immediate future. I shall of course consider re-joining when my company starts serious research and development work.

728

I realsie now that the profile needed updating, in particular "Signal processing, with particular reference to correlated and optical methods" - the subject is much too broadly defined.

I also found that some references on electro-acoustic transducers for U.W. sound slipped through the net. But certainly some useful sources and references came to light.

730

I think it would be most interesting to see how the SDI staff have modified our profiles to yied better results.

732

Thank you very much for your service over the past months. The only useful comment I wish to add is that it would be very nice to change ones profile quickly to a new topic of interest, and have confidence of getting, it right within say 1 month. I realise this requirement is probably not general.

734

I think that the system is a good idea. I do not always give the cards my immediate attention and I have not

always looked up the papers which I think that I should have, but certainly I have been much more aware of what has been published that I would have been without the cards.

May I repeat that the cards would be even more useful if each carried an abstract of the article referred to.

735

Thank you for including SCW in your system. I have found it useful, hope you have gained also from our participation.

737

My only real interests concerns the large number of relevant articles 'missed' by INSPEC.

I believe that this could be improved if a far more detailed description of my requirements had been asked for at the beginning.

740

Existing Company Library costs cover literature surveys and are self sufficient for my needs as well as being more specific.